GAZETTE
of the
UNITED STATES PATENT AND TRADEMARK OFFICE

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 28, 1983 Volume 1031 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of May 1983

Affirmed	183
Affirmed in Part	8
Reversed	54
Total	245

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,136,923, Re. S.N. 479,594, Filed Mar. 28, 1983, Cl. 339/258, UNITARY HOODED ELECTRICAL CONTACT, Tedford H. Spaulding, Owner of Record: *Bunker Ramo Corp., Oak Brook, Ill.,* Attorney or Agent: James P. DeClercq, et al., Ex. Gp.: 322

4,244,322, Re. S.N. 456,777, Filed Jan. 10, 1983, Cl. 118/658, MAGNETIC BRUSH TYPE DEVELOPING APPARATUS, Yutaka Nomura, et al., Owner of Record: *Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan,* Attorney or Agent: James R. Longacre, Ex. Gp.: 162

4,262,737, Re. S.N. 484,689, Filed Apr. 13, 1983, Cl. 165/012, EXTRUDER TEMPERATURE CONTROLLER, Louie M. Faillace, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Hillman, Ex. Gp.: 345

4,329,999, Re. S.N. 479,827, Filed Mar. 28, 1983, Cl. 128/760, PATIENT ATTACHED PATCH AND METHOD OF MAKING, Michael Phillips, Owner of Record: *Inventor,* Attorney or Agent: John McKinnon, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,195,868, Reexam. No. 90/000,380, Requested: May 11, 1983, Cl. 366/85, CONTINUOUS MIXER, Bernard A. Loomans, et al., Owner of Record: *Baker Perkins, Inc., New York, N.Y.,* Attorney or Agent: John F. Learman, Ex. Gp.: 242, Requester: Werner & Pfleiderer Corp., Ramsey, N.J.

4,019,518, Reexam. No. 90/000,376, Requested: May 9, 1983, Cl. 128/419R, ELECTRICAL STIMULATION SYSTEM, Donald D. Maurer, et al., Owner of Record: *Requester,* Attorney or Agent: Joseph F. Breimayer, Ex. Gp.: 335, Requester: Medtronic, Inc., Minneapolis, Minn.

4,174,481, Reexam. No. 90/000,375, Requested: May 12, 1983, Cl. 378/20, TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES, Reiner Liebetruth, Owner of Record: *Siemens Aktiengesellschaft, Berlin and Munich, Germany,* Attorney or Agent: Hill, van Santen, et al., Ex. Gp.: 330, Requester: Owner

4,305,763, Reexam. No. 90/000,383, Requested: May 24, 1983, Cl. 148/12.7A, METHOD OF PRODUCING AN ALUMINUM ALLOY PRODUCT, William E. Quist, et al., Owner of Record: *Boeing Co., Seattle, Wash.,* Attorney or Agent: Christensen, O'Connor, et al., Ex. Gp.: 111, Requester: Pechiney Ugine Kuhlmann, Lyon, France

Department of the Treasury
United States Customs Service

(T.D. 83-122)
19 CFR Part 133
Recordation of Trade Name: Chams de Baron Ltd.

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On Mar. 10, 1983, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CHAMS DE BARON LTD." was published in the Federal Register (48 FR 10188-10189). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than May 10, 1983. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "CHAMS DE BARON LTD." is recorded as the trade name used by

Chams De Baron Ltd., a corporation organized under the laws of the State of New York, located at 1350 Broadway, New York, N.Y. 10018. The trade name is used in connection with the following merchandise which is manufactured in Taiwan, Hong Kong, South Korea and the Philippines: men's and women's wearing apparel, including shirts, tops, sweaters, jackets and pants.

Date: May 25, 1983.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

A. PIAZZA,
May 20, 1983. *Acting Director, Entry Procedures and Penalties Division.*

Extension of Transition Period to File Oaths or Declarations in Compliance with 37 CFR 1.63

The Federal Register of Jan. 20, 1983 indicated at 48 FR 2706 that all oaths or declarations filed on and after Feb. 27, 1983, must comply with the requirements of 37 CFR 1.63 except for the transition period as noted below.

The Office indicated that it would continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983 during a transition period ending June 30, 1983, provided that the oath or declaration was attached to and was executed as a part of an application.

Although the Office is not required to do so, it intends to make translated declaration forms available to the public in at least the more frequently required non-English languages. Since these non-English language translations are not yet available, the transition period is extended to end on Sept. 30, 1983 rather than on June 30, 1983. During this period, the Patent and Trademark Office will continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983, if the oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective Oct. 1, 1983, all oaths or declarations filed under 37 CFR 1.51(a)(2) as a part of a patent application must fully comply with 37 CFR 1.63.

DONALD J. QUIGG,
May 31, 1983. *Acting Commissioner of Patents and Trademarks.*

Request for Comments on Proposed Expedited Patent Application Procedure

The Patent and Trademark Office is seeking comments on the desirability of providing a new procedure for highly expedited handling and prosecution of a patent application upon the payment of a relatively large fee set to recover the full cost of the expedited processing. The purpose of the procedure would be to provide a patent to applicants who need or desire a patent very quickly and are willing to pay the costs. It is anticipated that the pendency of such an application would normally be a few months. The application would literally be hand-carried through most of the processing in the PTO.

Implementation of such a procedure would require additional staffing of personnel throughout the Office who would personally process the application or insure its immediate processing by regular personnel, and the implementation of special filing, processing, and examining procedures and requirements. Accordingly, the costs would be relatively high.

A program of this nature would only be contemplated to the extent that it would not interfere with achievement of the PTO goal of 18 months average pendency for patent applications in 1987. An outline of the proposed procedure to expedite an application is set forth below:

1. Applicant requests special expedited application.
   a. At time of filing or anytime during pendency of application.
2. Required fees at time of filing (or when requested):
   a. Normal filing fee.
   b. Normal issue fee.
   c. Special fee set to recover the full costs of the expedited processing (possibly $4,000-$5,000 depending on the degree of prosecution permitted after final rejection under 6e below).
3. Applicant would agree to special requirements:
   a. Submission of information disclosure statement.
   b. Immediate correction of drawing informalities and objections.
   c. One month shortened statutory period for response to Office actions (extendable under 37 CFR 1.136).
   d. Automatic election of first claimed invention.
4. Application provided special expedited prosecution throughout Office.
   a. Essentially walk-through processing.
   b. All processing done out-of-turn on immediate basis.
5. Specially designated expeditors for clerical processing throughout Patent and Trademark Office:
   a. Would personally perform certain processing steps where possible.
   b. If not possible, would wait with application for immediate performance of processing steps by regular personnel.
   c. Hand-carry application from step to step.
   d. Special expeditors might be designated employees in existing organizations or a special central clerical operation that would serve as expeditors and do or oversee the processing for most other operations.
6. Examiner processing:
   a. Highest priority for examination.
   b. One month shortened statutory period for response.
   c. Interviews strongly encouraged.
   d. More use of telephone.
      (1) To resolve minor problems.
      (2) For follow-up on interviews.
      (3) To notify applicant of Office mailing and nature of communication.
   e. After final practice.
      (1) Alternative I - Normal tight second action final practice.
      (2) Alternative II - More liberal after final practice.
7. Special distinctive marking on file wrapper.
8. All incoming envelopes, responses, and correspondence specially identified to permit rapid routing and processing.
   a. Preference for hand-carry of all responses to the PTO.
9. Central monitoring of application progress throughout Office to insure that application is not lost or delayed.
10. Special expedited printing procedure.
11. Rules change required to implement.
12. Possible starting date - Jan. 1, 1985.

Written comments on the desirability of the Office offering such a procedure should be submitted by Sept. 30, 1983, and addressed to the attention of R. Franklin Burnett, Crystal Plz. 3-11A13, Patent and Trademark Office, Washington, D.C. 20231. For further information contact R. Franklin Burnett by telephone at (703)557-3054.

DONALD J. QUIGG,
June 1, 1983. *Acting Commissioner of Patents and Trademarks.*

Examination

Pursuant to the provisions of 37 C.F.R. 1.341(c), an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on Tuesday, Oct. 11, 1983.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

37 C.F.R. 1.341(f) provides, in pertinent part, "Officers and employees of the United States who are disqualified by statute (18 U.S.C. 203, 205) from practicing as attorneys or agents in proceedings or other matters before Government departments or agencies, may not be registered, * * * but officers or employees whose official duties require the preparation and prosecution of applications for patent may be registered (on compliance with the regulations in this part) or recognized to practice, to the extent necessary to carry out their official duties." If you are an officer or employee of the United States who is not disqualified for registration under 37 C.F.R. 1.341(f) when you apply to take the examination, your application for registration *must* be accompanied by your supervisor's *verified statement* that your official duties as a United States officer or employee require that you prepare and prosecute applications for patent. After passing the examination, you will be considered eligible for registration. If you are disqualified for registration under 37 C.F.R. 1.341(f) when you apply, approval of your application to take the examination will be subject to the following conditions.

1. If you pass the examination, you will not be registered so long as you remain disqualified for registration under 37 C.F.R. 1.341(f). However, if within one (1) year from the date notification of passing is mailed, your status changes and you are no longer disqualified under 37 C.F.R. 1.341(f), you will be considered eligible for registration upon satisfactory proof of your change in status.
2. If you have not become registered within one (1) year from the date notification of passing is mailed, you may not become registered thereafter except upon taking and passing another regularly scheduled examination.

The examination will be given under the supervision of the Office of Personnel Management (formerly Civil Service Commission), and may be taken in any of the cities in which the Office of Personnel Management regularly conducts examinations. Applications to take the examination must be filed in the Patent and Trademark Office together with a $75 fee not later than July 31, 1983.

Application blanks may be obtained from the Clerk of the Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plz., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

DONALD J. QUIGG,
June 1, 1983. *Chairman, Committee on Enrollment.*

Status of PTO Services

The following is an update of the status of PTO services as of May 31, 1983:

Service Item	FY 1983 Performance Goal	Actual	Comment
Filing Receipts:			
Patents	22	23	Reduced by 2 days in the past month.
Trademarks	30	88	Improvement expected over next few months.
Patent Copies:			
Window Coupons	5	90% within 5 days	
Mail Coupons	29	100% within 22 days	
Letter Orders	34	100% within 15 days	
Certified Copies:			
Trademark Registrations	30	12	
Applications-As-Filed	20	97% within 10 days	
File-Wrapper/Contents	N/A	100% within 20 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	33	
Filing Reg. Certificates	3	7	Regs. for 5/24 late from printer.
Assignments:			
Patents	25	24	
Trademarks	25	22	
Avg. Days from Issue Fee Payment to Issue Date		97	
Patent Official Gazette:			
In Bookstore	Issue Date	On Schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 2 days late	
Patent Copies Available	Issue Date	99%	
Trademark Official Gazette:			
In Bookstore	Issue Date	On Schedule	
Mailed	Issue Date	On Schedule	
Trademark Regs. Mailed	Issue Date	7 days	Regs. for 5/24 late from printer.

IMPROVEMENTS TO SERVICES

- *Documents Processed at the Attorney's Window*—All non-fee amendments filed by 2:30 p.m. at the Mail Room's Attorney's Window, on the lobby level of Crystal Plz. 2, are processed and routed to their proper destinations by 3:30 p.m. that same day. Fee-related amendments, as well as non-fee-related work filed after 3:30 p.m. will be processed and delivered the following work day.
- *Microfilming Active Trademark and Patent File Histories*—On or about June 20, 1983, sample microfiche copies of new patent issues and a Minolta reader/printer will be available to public search room users. We will also provide a survey form for the public to assist us in evaluating fiber quality, format and equipment capabilities.
- *New Statistic*—A new service statistic has been added to the service report - the average number of days from patent issue fee payment to issue date. There is no goal indicated because the specific schedule for issue sizes and the mix of patents (chemical, electrical, mechanical) dictate the number and type of applications which can be built into each issue.

June 6, 1983.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of June 28, 1983

D. 268,643	4,342,337	4,368,137	4,376,037
3,618,518	4,342,720	4,368,391	4,376,043
3,838,535	4,343,078	4,368,395	4,376,065
4,007,431	4,343,531	4,369,999	4,376,217
4,117,233	4,345,073	4,370,179	4,376,447
4,146,453	4,345,498	4,370,217	4,376,669
4,169,841	4,346,061	4,370,395	4,376,670
4,174,575	4,348,317	4,370,461	4,377,619
4,175,135	4,348,861	4,371,428	4,377,638
4,213,118	4,349,648	4,372,053	4,377,809
4,236,930	4,351,156	4,372,712	4,378,186
4,252,694	4,353,480	4,372,741	4,378,487
4,260,465	4,354,038	4,372,784	4,379,459
4,267,244	4,354,199	4,373,061	4,379,906
4,292,429	4,355,376	4,373,140	4,380,062
4,292,889	4,358,876	4,373,179	4,380,220
4,293,232	4,359,560	4,373,410	4,380,431
4,294,898	4,364,723	4,373,530	4,380,487
4,295,524	4,364,745	4,373,659	4,380,564
4,299,247	4,364,749	4,374,035	4,380,708
4,301,921	4,365,316	4,374,059	4,381,160
4,304,062	4,365,936	4,374,076	4,381,331
4,306,304	4,365,972	4,374,323	4,382,136
4,308,242	4,367,239	4,374,751	4,382,237
4,314,030	4,367,532	4,374,906	4,382,453
4,314,052	4,367,700	4,375,091	4,382,998
4,328,548	4,367,780	4,375,757	4,383,174

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

June 28, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,887,450 (100th)

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING POLYMERIC BINDING AGENTS

Michael N. Gilano, Fullerton, Calif.; Richard E. Beaupre, West Barrington, R.I.; Melvin A. Lipson, Fullerton, Calif., assignors to Dynachem Corporation, Santa Fe Springs, Calif.

Continuation of Ser. No. 112,797, Feb. 4, 1971, abandoned. Reexamination Request No. 90/000,017, Jul. 2, 1981.

Reexamination Certificate for Patent No. 3,887,450, issued Jun. 3, 1975, Ser. No. 315,153, Dec. 14, 1972.

U.S. Cl. 204/159.15 **Int. Cl.[3] C08F** *2/48, 2/46*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3, 6** and **9** are determined to be patentable as amended:

Claims **4, 5, 7, 8** and **10–15**, dependent on amended claims, are determined to be patentable.

New claims **16** and **17** are added and determined to be patentable.

1. A photopolymerizable composition *characterized by being used as a photoresist in the form of a storable sheet or roll on a peelable film support* [comprising] *consisting essentially of:*

A. from 10 to 60 parts by weight of an addition polymerizable material consisting essentially of and being solely one or more non-gaseous compounds, containing at least two terminal ethylenic groups, having a boiling point above 100° C., and being selected from the group consisting of an unsaturated ester of a polyol, an unsaturated amide, and a vinyl ester;

B. from 0.001 to 10 parts by weight of a photo-initiated free-radical generating addition polymerizing initiating system;

C. from 0.001 to 5 parts by weight of a thermal-addition polymerization inhibitor; and

D. from 40 to 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

a first monomeric material which contains one or more non-acidic vinyl compounds selected from the group having the general formula:

wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group; and a second monomeric material which consists essentially of one or more alpha,beta-*ethylenically* unsaturated [carboxyl] *carboxylic acid- or anhydride*-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render *substantially all of* the binding agent soluble in a dilute *substantially wholly* aqueous solution containing *2% sodium carbonate* [from 0.01 to 10 percent of a water-soluble base] *wherein following photopolymerization, the photopolymerized portion of the composition is unaffected by sequential contact first with said dilute aqueous solution containing 2% sodium carbonate and subsequently followed by a 45° Baumé solution of ferric chloride and further wherein the photopolymerized portion of the composition is removable from a substrate by a heated solution containing 3% sodium hydroxide.*

REISSUES

JUNE 28, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,288

MACHINE TOOL

Hiroshi Matsuzaki, Kanazawa, and Yoshihiro Tsukiji, Komatsu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

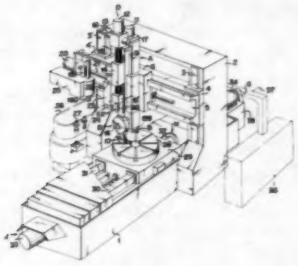
Original No. 4,118,844, dated Oct. 10, 1978, Ser. No. 829,193, Aug. 30, 1977. Application for reissue Jan. 3, 1980, Ser. No. 109,261

Claims priority, application Japan, Aug. 30, 1976, 51-102691; Aug. 30, 1976, 51-102692; Aug. 30, 1976, 51-102693

Int. Cl.³ B23Q *3/155;* B23C *1/12*

U.S. Cl. 29—27 C

8 Claims



1. A complex machine tool comprising:

a bed;

a table mounted on the bed so as to be slidably moved in [the] *a* direction of *the* longitudinal axis thereof;

rotating means mounted on said bed to rotate said table;

transfer means mounted on said bed so as to transfer said table in the direction of *the* longitudinal axis of the bed;

rotary indexing means [adapted to index] *for indexing* said table;

a pair of columns installed vertically on either side of said bed;

a cross rail transversely supported on said columns;

ram means attached to said cross rail [and adapted to be moved at right angles to the face of said table] *for a vertical movement;*

means for moving said ram means in a direction at right angles to the face of said table;

a tool post mounted [on] to [the] *a* lower end face of said ram means [and having] *for receiving* a turning tool [fixedly secured thereto];

first tool clamper means provided within said ram means for clamping and unclamping the turning tool in said tool post;

a turret head mounted on one face of said ram means, said turret head having a [rotating] main spindle *rotatably supported therein* for mounting a rotary machining tool;

means provided within said ram means for indexing said turret head means;

second tool clamper means provided within said ram means for clamping and unclamping the rotary machining tool in said turret head; and

[a turret head rotating means adapted to rotate said turret head] *means for driving said main spindle for rotary machining operations.*

Re. 31,289

COLOR ENDOSCOPE WITH CHARGE COUPLED DEVICE AND TELEVISION VIEWING

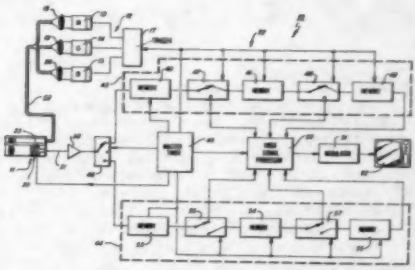
William C. Moore, Skaneateles; Richard W. Newman, Auburn, and Dominick Danna, Syracuse, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Original No. 4,253,447, dated Mar. 3, 1981, Ser. No. 951,653, Oct. 16, 1978. Application for reissue Jul. 10, 1981, Ser. No. 282,086

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—6

8 Claims



1. An endoscope for providing color information in a form that is capable of being displayed on a standard format video receiver utilizing odd and even interlaced fields for each frame of information displayed, the endoscope including

a viewing head that is capable of being inserted into a body cavity that contains a self-scanning solid state imaging device for recording light images of objects positioned in the viewing region of the head and providing a line by line electrical read-out signal containing the recorded information,

lighting means for bringing illumination from a remote location into the viewing region of said viewing head to sequentially light the viewing region with light of primary colors during each field related period so that read-out signals relating to the color images recorded by the imaging device are clocked out of the device in a sequential flow relationship,

a first memory unit for individually storing read-out signals regarding each of the primary colors clocked out of the imaging device for display during an even field period,

a second memory unit for individually storing read-out signals regarding each of the primary colors clocked out of the imaging device for display during an odd field period, and

switching means for forwarding the signals stored in said first memory unit simultaneously to a transmitter matrix for [combining the color information into composite luminance and chrominance signals for] display in a [standard format] television receiver during an even field period and for forwarding signals stored in said second memory unit simultaneously to said matrix for display during an odd field period.

Re. 31,290

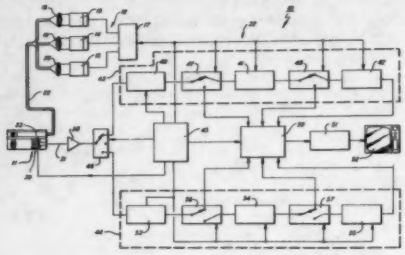
COLOR ENDOSCOPE

William C. Moore, Skaneateles; Richard W. Newman, Auburn, and Dominick Danna, Syracuse, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Original No. 4,261,344, dated Apr. 14, 1981, Ser. No. 78,300, Sep. 24, 1979. Division of Ser. No. 951,653, Oct. 16, 1978, Pat. No. 4,253,447. Application for reissue Jul. 10, 1981, Ser. No. 282,087

Int. Cl.³ A61B 1/06

U.S. Cl. 128—6 7 Claims



1. In an endoscope of the type having a relatively small viewing head containing a single solid state imaging device for recording light images formed in the viewing region of the head and providing an electrical read-out signal containing the image information, the method of generating a full color standard format video signal including the steps of

providing an individual light source for each of the primary colors utilized in the video system at a location that is remote from the viewing head,

turning each of the light sources on and off in an ordered sequence,

transmitting the light emitted by each source into the viewing region of the head by means of a randomly dispersed bundle of optical fibers whereby image shadowing in the viewing region is minimized,

sequentially recording each of the color images on the single solid state imaging device,

electrically coupling the read-out signals of the imaging device to a memory,

storing the individual color read-out signals in the memory, and

periodically forwarding the color signals stored in the memory simultaneously to a processor for [combining the color signals into composite signals that are compatible with a standard format] *placing the signal information in a format compatible with a* color receiver.

Re. 31,291

ROAD SURFACE MARKING PREFABRICATED TAPE MATERIAL, HAVING RETROREFLECTIVE COMPOSITE ELEMENTS ASSOCIATED THERETO

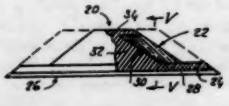
Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Original No. 4,129,397, dated Dec. 12, 1978, Ser. No. 850,024, Nov. 9, 1977. Application for reissue Sep. 22, 1980, Ser. No. 189,771

Claims priority, application Italy, Nov. 10, 1976, 29196 A/76

Int. Cl.³ E01F 9/04

U.S. Cl. 404—14 9 Claims



9. A prefabricated road-surface marking tape, comprising a tape adapted to be placed on and secured to a road surface to form a traffic aid thereon; a plurality of reflectors spaced lengthwise of and upwardly projecting from an upper face of said tape, each of said reflectors comprising a casing having a generally planar base portion of a first width and having a bottom face juxtaposed with said upper face, and a receiver portion of a smaller second width projecting upwardly from said base portion, and optically reflective elements sheltered in said receiver portion and operative for retroreflecting a relatively narrow beam of light lengthwise of said tape in one direction when impinged by vehicle-emitted light rays travelling in the opposite direction; and means including a plurality of recesses in said bottom face and accommodating portions of said tape therein, for fixedly anchoring said reflectors to said tape.

Re. 31,292

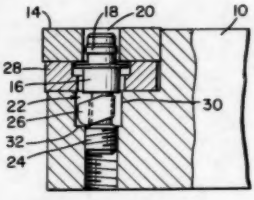
CLAMPING MECHANISM FOR CUTTING INSERT

Robert A. Erickson, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Original No. 4,245,937, dated Jan. 20, 1981, Ser. No. 946,814, Sep. 28, 1978. Application for reissue Mar. 16, 1981, Ser. No. 244,009

Int. Cl.³ B26D 1/00; B25G 3/20

U.S. Cl. 407—105 9 Claims



1. A cutting tool for holding a cutting insert having an axial hole therein, which comprises: a cutter body; an insert seat on said cutter body having at least a bottom wall and a side wall, the insert seat having a transverse pin receiving hole located for at least partial registration with the axial hole in the insert; abutment means in said pin receiving hole beneath said insert seat; a pin having a head for engaging the axial hole of the insert and another end for moving engagement with said cutter body in said pin receiving hole; [an] *a resilient* abutment shoe *captively engaged to said pin and* pivotally mounted in relation to and between said abutment means and said pin so that when said pin is moved in a first direction in the hole said shoe pivots forcing the head of the pin to tilt toward said side wall and clamp the insert in said insert seat, said pivotal shoe allowing said pin to straighten when said pin is moved in a second direction in said hole.

8. A shoe member for use in an insert clamping arrangement which comprises a body of tough resilient material having a top surface having a slanted portion, a bottom surface, a peripheral surface connecting said top surface to said bottom surface, a bore communicating between said top surface and said bottom surface and intersecting said peripheral surface continuously from top to bottom so as to provide said body with a C-shaped configuration when viewed in plan, said bore aligned obliquely with planes defined by said top slanted portion and said bottom surface, a convex surface forming the juncture of said peripheral surface and said bottom surface, and wherein said convex surface is generally located on said shoe body opposite to where said bore intersects said peripheral surface.

9. A pin and shoe arrangement for holding a cutting insert having an axial hole therein on a cutter body with an insert seat thereon, said pin and shoe arrangement comprising: said shoe having a body of tough resilient material having a top surface having a slanted portion, a bottom surface, a peripheral surface connecting said top surface to said bottom surface, a bore

communicating between said top surface and said bottom surface and intersecting said peripheral surface continuously from top to bottom so as to provide said body with a C-shaped configuration when viewed in plan, said bore aligned obliquely to planes defined by said top slanted portion and said bottom surface, a convex surface forming the juncture of said peripheral surface and said bottom surface, and wherein said convex surface is generally located on said shoe body opposite to where said bore intersects said peripheral surface; said pin having a threaded end, a reduced diameter intermediate section connecting said threaded end to an increased diameter head end, and wherein said reduced diameter intermediate section is of a length and a diameter sized to be loosely engageable in said bore of said shoe; and said reduced diameter intermediate section of said pin loosely engaged in the bore of said shoe such that said bottom surface of said shoe faces said threaded end of said pin.

Re. 31,293

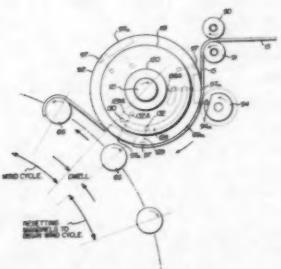
MACHINE FOR PRODUCING A PLASTIC-COVERED GLASS CONTAINER

Stephen W. Amberg, St. James; Thomas E. Doherty, Setauket, both of N.Y., and Clarence A. Heyne, deceased, late of Sun City, Ariz., assignors to Owens-Illinois, Inc., Toledo, Ohio

Original No. 38,224,598, dated Jul. 9, 1974, Ser. No. 378,002, Jul. 10, 1973. Division of Ser. No. 209,751, Dec. 20, 1971, Pat. No. 3,802,942. Application for reissue Sep. 22, 1980, Ser. No. 189,265

Int. Cl.³ B31B *1/16*; B31C *1/00*

U.S. Cl. 493—11 **2 Claims**



13. A feed device for a flexible web of material comprising means supporting a web supply of said material, a pair of feed rollers for engaging the web, said rollers rotatably mounted on parallel shafts, means advancing the web into the feed rollers, means connected to said parallel shafts for rotating said feed rollers in opposite directions advancing the web therebetween, a feed drum, means mounting said drum parallel with said rollers and spaced beyond said feed rollers from said web advancing means, said feed drum comprising a continuous peripheral surface of a length greater than one predetermined strip length of material to be cut from said web, first vacuum means connected to the feed drum peripheral surface, and second vacuum means connected to the feed drum peripheral surface, said first and second vacuum means being spaced circumferentially on said drum a distance less than said predetermined strip length, means connected to rotatably drive said feed drum at a speed such that the surface velocity of said drum exceeds the linear velocity of the web being moved by the feed rollers, the first vacuum means and second vacuum means applying a slip-clutch effect on said web maintaining it taut between said feed rollers and feed drum, knife means operable for cutting predetermined lengths of strip from said web on said feed drum, a winding mandrel having a curved outer surface and spaced from said knife means in the direction of peripheral movement of the feed drum surface, said mandrel being disposed parallel with said drum and its outer surface substantially tangentially adjacent said drum, means connected to the feed drum peripheral surface for applying a puff of air under pressure to the underside of the leading edge portion of the strip, and means for introducing air under pressure to said last-mentioned means responsive to movement of the leading edge portion of the strip on the feed drum into tangential relation with the outer surface of the mandrel, thereby positively transferring the strip to the mandrel.

Re. 31,294

MATERIAL-HANDLING APPARATUS

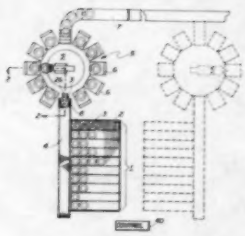
Josef Marosan, Västra Ringvägen 26A, Eksjö, Sweden

Original No. 4,126,506, dated Nov. 21, 1978, Ser. No. 802,665, Jun. 2, 1977. Application for reissue Nov. 19, 1980, Ser. No. 208,277

Claims priority, application Sweden, Jun. 8, 1976, 7606397

Int. Cl.³ B29H *17/36*

U.S. Cl. 156—396 **26 Claims**



1. Material-handling apparatus for a plant processing different sizes or types of products comprising:

(a) a magazine for storing the products to be treated, each size or type of product having a separate supply, a single feed conveyor operable to receive the products from all of said supplies, and to advance a product from said supplies to the terminal end of the feed conveyor, and having stop means to stop the conveyor when a product is positioned at its terminal end;

(b) a plurality of product-treating machines aligned side-by-side with the terminal end of said conveyor;

(c) an outgoing conveyor for removing the treated products from said plurality of machines and having a feed end aligned within said machines;

(d) transfer mechanism for transferring the product selectively from the terminal end of the feed conveyor to a product-treating machine and from a product-treating machine to the feed end of the outgoing conveyor;

(e) a fixing unit associated with the terminal end of the feed conveyor to engage the product thereon and position it in a predetermined position;

(f) indexing means including stop means on the transfer mechanism and a plurality of individual stop means, at least one for each treating machine, operable selectively to index the transfer mechanism to a selected treating machine; and

(g) control means interconnecting said magazine, said treating machines, said transfer mechanism and said indexing means to discharge a product of a given size or type onto the feed conveyor when any selected treating machine for that size or type of product is in condition to receive the product, and conditioning said apparatus to cause said transfer mechanism to transfer the product from the feed conveyor to said selected treating machine.

Re. 31,295

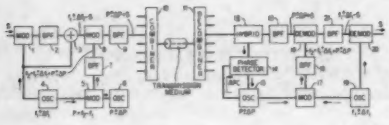
CARRIER SUPPLY FOR FREQUENCY DIVISION MULTIPLEXED SYSTEMS

Thomas J. Haley, Summit, N.J.; Thomas B. Merrick, Plaistow, N.H., and James S. Ronne, Groveland, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,733,438, dated May 15, 1973, Ser. No. 119,750, Mar. 1, 1971. Application for reissue Feb. 2, 1981, Ser. No. 230,874

Int. Cl.[3] H04J *1/02, 1/06*

U.S. Cl. 370—120 5 Claims



4. A receiver in a frequency division multiplexed transmission system for demodulating an input signal modulated n times [comprising], *the input signal including a carrier pilot signal, said receiver comprising: a phase detector coupled to the input of said receiver,* a plurality of n demodulators having their respective first input and output coupled in a series string between the input and output of said receiver, a plurality of n oscillators having individual output frequencies, a plurality of n−1 modulators having their respective first and second inputs connected to individual pairs of adjacent oscillators of said plurality of n oscillators to form a series string of alternate oscillators and modulators beginning with a first oscillator and ending with a last oscillator of said plurality of n oscillators, the last of said plurality of n oscillators in said series string being connected directly to the second input of the demodulator of said n demodulators connected to the output of said receiver, *means connecting said phase detector with said first oscillator in an automatic phase control loop for establishing phase lock with the carrier pilot signal,* and means connecting the outputs of individual ones of each of said plurality of n−1 modulators to the second input of individual ones of each of said plurality of n demodulators except the demodulator connected to the output of said receiver.

PLANT PATENTS

GRANTED JUNE 28, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,063

AFRICAN VIOLET NAMED JOYCE

Arnold W. Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan-American Plant Company, Parrish, Fla.

Filed May 28, 1981, Ser. No. 268,099

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new variety of African Violet, substantially as herein shown and described, characterized by its profuse production of medium sized flowers, bloomed intermittently and borne on strong, upright stems.

5,064

CHRYSANTHEMUM NAMED TIGER

May Shoesmith, Westfield, England, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Oct. 19, 1981, Ser. No. 312,944

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—78 1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized by its small button type of inflorescence having a distinct light bronze color, by its profuse blooming habit, and by its capability for year around small pot production.

PATENTS

GRANTED JUN. 28, 1983

ERRATA

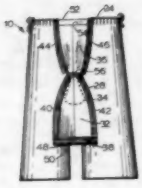
For CLASS	See PATENT NO.
604–236	4,390,016
604–270	4,390,017
436–518	4,390,343
428–090	4,390,387
419–066	4,390,488
424–282	4,390,715
377–006	4,390,779
377–044	4,390,780
179–001	4,390,834

PATENTS

GRANTED JUNE 28, 1983

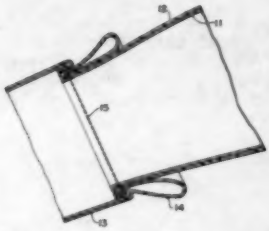
GENERAL AND MECHANICAL

4,389,733
UNIFORM FOR KARATE AND THE LIKE
James L. Boykins, Jr., 1615 N. Monroe St., Baltimore, Md. 21217
Filed Feb. 17, 1981, Ser. No. 234,929
Int. Cl.³ A41D *13/00, 27/20*
U.S. Cl. 2—2 **2 Claims**



1. In a uniform for a wearer performing one of the martial arts such as Karate, which includes pants with an opening in front, a crotch having a mid-point, supporting means **(52)** for the pants and means for holding **(32)** detachably in the pants a cup **(34)** of rigid material in location for groin protection, the improvement comprising: said supporting means **(52)** having a length extending along the front of the pants, the pants having structure **(37)** defining the opening as beginning at the supporting means **(52)** and extending downwardly and rearwardly to said crotch mid-point, the means **(32)** for holding having connection at said crotch mid-point and proportion for closing said opening when in an upward position from said connection, first means **(50, 48)** for securing the means **(32)** for holding along the length of said means **(52)** for supporting, second means **(54,52)** for securing the means **(32)** for holding along the length of said means **(52)** for supporting, means **(40,42,44,46)** for attaching said means **(32)** for holding to the pants structure **(37)** defining the opening, said first means **(50,48)** for securing including said proportion having a length permitting the upper end **(48)** of the means **(32)** for holding to be passed upwardly over the front of the supporting means **(52)** and a portion thereof then returned downwardly to the rear of the supporting means **(52)**, said downwardly returned portion **(48)** being in position for being gripped between said supporting means **(52)** and a wearer, said second means **(54,52)** for securing, securing said downwardly returned portion **(48)** to the supporting means **(52)** in said position for being gripped, said supporting means **(52)** being belt-like in shape and location, said first means **(50,48)** for securing and said second means **(54,52)** for securing including together a first fastening area **(50)** on a forward side of said downwardly returned portion **(48)** and a second fastening area **(54)** on a rearward side of the supporting means **(52)**, said means **(32)** for holding being "V"-shaped in front view, with the apex of the "V" adjacent said crotch mid-point, said means **(40,42,44,46)** for attaching continuously attaching the sides of said "V" shape along the pants structure defining the opening, and the means **(32)** for holding including a pocket **(32)** with an opening **(38)** at the top for inserting and removing a said cup, the opening of the pocket being at a height causing the pocket to be held closed as result of said securing of the means for holding by said first means **(50,48)** for securing.

4,389,734
IMPERVIOUS OVERSLEEVE WITH ANTIROLL-DOWN COLLAR FOR SURGICAL GOWN
Norman J. Franz, Germantown, and Elizabeth B. Reynolds, Bartlett, both of Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio
Filed Jun. 18, 1981, Ser. No. 274,983
Int. Cl.³ A41D *27/12;* **A41B** *9/00*
U.S. Cl. 2—59 **10 Claims**



1. A surgical gown sleeve the improvement of which comprises a collar attached at an intermediate location of the forearm region of said sleeve and overlying a portion of said sleeve, said collar having sufficient bulk such that it causes a local bulge in the cuff of a surgeon's glove donned over said collar, whereby the diameter of said glove cuff at said bulge is at least about 5% greater than the adjacent diameter of said glove cuff toward the opening of said glove where said glove cuff does not overlie said collar.

4,389,735
CONVERTIBLE ARTICLE
Rita E. McLaughlin, P.O. Box 1662, Boston, Mass. 02105
Filed Oct. 26, 1981, Ser. No. 315,026
Int. Cl.³ A41B *11/00*
U.S. Cl. 2—94 **8 Claims**

1. A convertible article adapted to be worn by an individual in one of a first and second modes, said article comprising, in combination:

a coat;

a storage pack formed to an exterior portion of a part of said coat, said storage pack including a first compartment for containing one or more objects to be carried in said storage pack;

shoulder straps secured to said storage pack for extending around the shoulders of the individual so that the storage

pack is supported, at least in part, by said straps when said article is worn by said individual in either of said first or second modes; and

means cooperative with the interior portion of said part of said coat for defining a second compartment for receiving the coat in a concealed manner;

wherein in said first mode said coat and said storage pack are worn by and the shoulder straps extend on the exterior side of said coat around the shoulders of the individual, and in said second mode said storage pack is worn by and the shoulder straps extend around the shoulders of the individual with said coat disposed in and concealed by said second compartment.

4,389,736

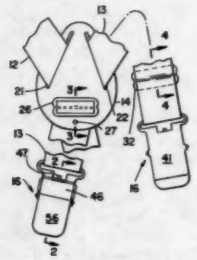
TOOL BELT SUSPENDERS

Norman L. Clifton, 4806 Los Arboles Pl., Fremont, Calif. 94536

Filed May 7, 1981, Ser. No. 261,575

Int. Cl.³ A41F *3/04, 3/02;* **A44B** *21/00*

U.S. Cl. 2—328 **2 Claims**



1. Improved suspenders for supporting a belt adapted to carry tools or the like comprising

a pair of straps adapted to extend one over each shoulder of a wearer and to cross in the back,

a cross-over piece having a pair of inclined slots disposed above a pair of horizontal slots through which said straps are threaded to cross over each other, said straps being separately threaded through said inclined slots and both straps being threaded through both horizontal slots, and said piece having an aperture therethrough for hanging of the suspenders on a peg or the like, and

strong metal clasps attached to each end of each of said straps and each having an over center lock thereon for firmly gripping a belt between facing ends of a pair of plates.

4,389,737

HYDRAULICALLY ACTUATED CARDIAC PROSTHESIS WITH THREE-WAY VENTRICULAR VALVING

Thomas C. Robinson; Sotiris Kitrilakis, both of Berkeley, and Thomas B. Martin, Jr., Oakland, all of Calif., assignors to Foxcroft Associates, San Antonio, Tex.

Filed Sep. 15, 1981, Ser. No. 302,590

Int. Cl.³ A61F *1/24;* **A61M** *1/03*

U.S. Cl. 3—1.7 **28 Claims**

1. An implantable hydraulic actuation system for supplying motive power to a blood pumping chamber having a flexible portion comprising:

an actuation fluid reservoir;

actuation fluid pumping means in fluid communication with said reservoir for pumping actuation fluid therefrom;

an actuation chamber having an actuation fluid inlet, and actuation fluid outlet, said actuation chamber being adapted to cause displacement of the flexible portion of said blood pumping chamber in response to changes in volume of actuation fluid in said actuation chamber; and

three-way valve means in fluid communication with said actuation chamber, said pumping means and said reservoir, said valve means being adapted to alternately and repetitively direct actuation fluid from said pumping means to said actuation chamber through said actuation fluid inlet, and then from said actuation chamber to said reservoir through said actuation fluid outlet, said valve means comprising:

a fluid-tight inlet manifold on said actuation chamber surrounding said actuation fluid inlet and in fluid communication with said pumping means;

a fluid-tight outlet manifold on said actuation chamber surrounding said actuation fluid outlet, said outlet manifold having at least one actuation fluid outlet port in fluid communication with said reservoir;

an inlet valve member in said inlet manifold movable between an open position clear of said actuation fluid inlet to permit actuation fluid entering said inlet manifold from said pumping means to fill said actuation chamber, and a closed position blocking said actuation fluid inlet to prevent the flow of actuation fluid therethrough;

an outlet valve member in said outlet manifold movable between an open position clear of said actuation fluid outlet port to permit actuation fluid to drain from said actuation chamber to said reservoir, and a closed position blocking said actuation fluid outlet port to prevent flow of actuation fluid therethrough;

coupling means interconnecting said inlet and outlet valve members for synchronizing their movements so that when one of said valve members is in its open position the other valve member is in its closed position; and

drive means for moving said valve members between their open and closed positions.

4,389,738

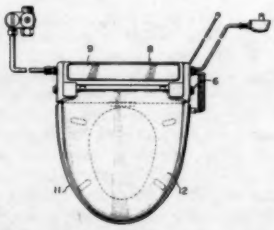
BODY PART CLEANSING DEVICE

Shizuka Ando; Hiroshi Oyama, and Toshio Yamaguchi, all of Kitakyushu, Japan, assignors to Toto, Ltd., Fukuoka, Japan

Filed Mar. 17, 1981, Ser. No. 244,668

Int. Cl.³ A47K *4/00, 3/20*

U.S. Cl. 4—420.2 **15 Claims**

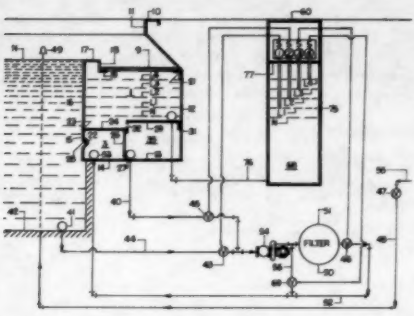


1. A body part cleansing device adapted to be used with a toilet, said device comprising a nozzle comprising means for directing a jet of warm water and air for cleaning to a predetermined part of a user's body and an air intake unit adapted to introduce said air into said nozzle to be mixed with heated water within said nozzle, said nozzle further comprising an injector member and a nozzle member, said injector member and said nozzle member being detachably connected, said injector member having a throttle hole, and said nozzle member having a guide passage connected to said throttle hole, said air intake unit being connected to said guide passage.

4,389,739
AUTOMATED SURGE WEIR AND RIM SKIMMING GUTTER FLOW CONTROL SYSTEM

William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710

Filed Mar. 30, 1981, Ser. No. 249,248
Int. Cl.³ E04H 3/16, 3/20
U.S. Cl. 4—512 64 Claims

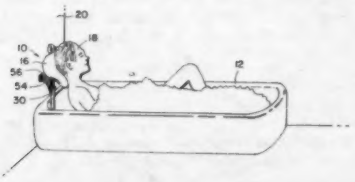


1. An automated skimming flow perimeter gutter flow control system for swimming pools comprising, in combination, a water cleaning and recirculation system receiving water from the pool, cleaning it, and returning it to the pool; a gutter conduit for disposition about the perimeter of a swimming pool, receiving overflow across a top edge thereof and adapted to carry water at a level below a predetermined level in the swimming pool; a drain line connecting the gutter conduit with the water recirculation system; suction means in series flow connection with the gutter conduit and drain line for positive withdrawal under suction of water from the gutter conduit and feed of such water to the water recirculation system for return to the pool; at least one of (a) means for controlling water recirculation capacity to accommodate any selected flow of water from the gutter to the water recirculation system; and (b) means for controlling suction flow from the gutter to the water recirculation system; and at least one water level-responsive sensor sensing and directly responding to the level of water in the gutter conduit by adjusting at least one of the means controlling water recirculation capacity to accommodate flow from the gutter and the means for controlling suction flow, to increase gutter drain flow sufficiently to prevent gutter water flooding back from the gutter to the pool.

4,389,740
BATH TUB HEAD REST

Hugh A. Henry, P.O. Box 1892, St. Thomas, V.I. 00801

Filed May 7, 1981, Ser. No. 261,601
Int. Cl.³ A47K 3/022
U.S. Cl. 4—575 5 Claims



1. A head rest comprising, in combination:

(a) a head rest member upon which a head is rested, said head rest member being adapted to receive the back of the user's head;

(b) first means for pivotally and rotatively mounting said head rest member, said first means comprising a post having a first end adjacent to said rest member and a second end, said first means further comprising a tongue member that is connected to said head rest member and is rotatable in a vertical plane about a horizontal axis on said first end of said post, said post having a diametrical channel formed at said first end thereof in which said tongue member is mounted receivably for said rotation;

(c) locking means for locking said tongue member at a desired angular position in said channel of said post;

(d) means for mounting said first means to a stationary frame, said means comprising an elongated column having a first end and a second end remote from said first end, said elongated column having a hollow interior adjacent said first end, said second end of said post being positioned in said hollow interior of said first end of said elongated column;

(e) said post comprising a circumferential flange attached adjacent to said second end of said post and a circumferential ring bearing attached to said circumferential flange

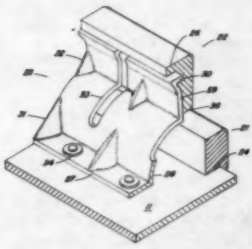
(f) said first end of said elongated column also having a circumferential flange and a circumferential ring bearing attached to said flange toward said second end of said post, said ring bearing of said post and said ring bearing of said column abutting each other to thereby allow for rotational movement of said rest member; and

(g) said second means further comprising a suction cup attached to said second end of said elongated column for attaching said head rest to a stationary frame.

4,389,741
WATERBED FRAME ASSEMBLY

Lynn D. Larson, 6501 Park Crest, Lincoln, Nebr. 68506

Filed Feb. 26, 1981, Ser. No. 238,434
Int. Cl.³ A47C 19/00, 27/08
U.S. Cl. 5—400 7 Claims



1. A frame for a waterbed comprising:

a base;

a containing wall connected to said base at the periphery of said base whereby said base and said containing wall form an open coffer box capable of accepting and supporting a waterbed mattress;

an internal cavity within said containing wall for accepting sheets and other bedding used on a waterbed;

opening means for inserting sheets and other bedding into said enclosed space;

said containing wall is comprised of a plurality of elongate wall sections;

each elongate wall section comprising:

(a) a horizontally extending vertically upright lower member;

(b) a horizontally extending vertically upright upper member positioned above said lower member to form a vertical wall with a continuous horizontal slit therein; and

(c) a horizontally extending flexing member positioned inwardly of said upper and lower members;

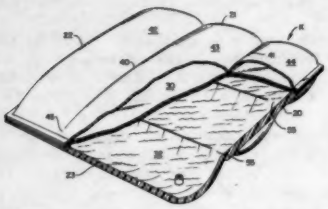
said flexing member being disposed in intersecting angularity with said upper member and wherein said flexing member has a top and a bottom and wherein the top of said flexing member is fixedly attached to said upper member and wherein the bottom of said flexing member is fixedly attached to said base.

4,389,742

PRESSURE CONTROLLED AIR/WATER CUSHION

Nick R. DeWitt, 218 Windyam Dr., Portola, Calif. 94025

Filed Jan. 2, 1981, Ser. No. 222,207
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—455 **2 Claims**



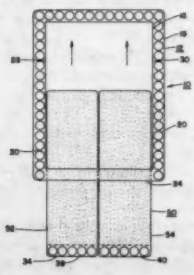
1. A cushion for use between a support and a person seated on said support; the improvement in said cushion comprising first, second, and third membranes, said membranes covering an area sufficient to support said person in said seat, all said membranes joined at the side edges thereof to other membranes in a three-membrane cushion to form a first fluid tight compartment between said first and second membranes and a second fluid tight compartment between said second and third membranes; at least two substantially parallel seams in every compartment, wherein said seams within said first compartment are disposed at right angles to said seams in the second compartments, said seams dividing said compartments into at least three chambers, said seams including along one portion thereof an opening through said seams to permit fluid communication between chambers defined by the seams in the compartments on each side of said seams; said cushion at one of said compartments filled with water; said cushion at the other of said compartments filled with air.

4,389,743

MATTRESS ARRANGEMENT HAVING A REMOVABLE SIDE-INSERTABLE CENTER CORE STRUCTURE

Milton A. Callaway, Jackson, Oreg., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Jun. 22, 1981, Ser. No. 276,173
Int. Cl.³ A47C *27/15, 27/04*
U.S. Cl. 5—464 **39 Claims**



1. A mattress arrangement including a removable and interchangeable mattress center core structure locatable within a mattress perimeter section, comprising in combination:

(a) a substantially rigid mattress perimeter structure including support means defining the perimeter outline of said mattress, said support means having an opening communicating with the interior of said mattress arrangement along one side of said mattress perimeter,

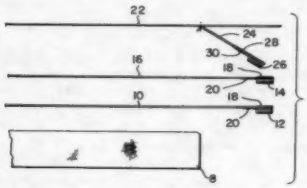
(b) and at least one mattress core section being insertable into said mattress perimeter structure through said opening, said core section being dimensioned to form a complete mattress arrangement in conjunction with said perimeter structure and having one end thereof defining a portion of the perimeter structure.

4,389,744

SYSTEM AND METHOD FOR SECURING BED COVERINGS TO THE MATTRESS OF A BED

Gerald E. Monroe, 1516 NE. 96th St., Seattle, Wash. 98115

Filed Nov. 13, 1980, Ser. No. 206,353
Int. Cl.³ A47G *9/02*
U.S. Cl. 5—498 **6 Claims**



1. A system for securing coverings to the mattress of a bed to prevent their being pulled loose by one sleeping on the bed and make the task of making the bed easier and faster, comprising:

a mattress;

a top sheet for the mattress of greater length and width than the mattress having an elastic strap secured near one end to one surface thereof at two spaced points along the width dimension of the sheet a distance apart essentially equal to the width of the mattress, the strap adapted to fit around and extend over the upper surface of the foot end of the mattress when the end of the sheet having the strap is wrapped around the foot end of the mattress; and

a spread to cover the top sheet and mattress of greater length and width than the mattress having a flap with a width essentially equal to the width of the mattress having an elastic strap with its free end secured at spaced points to one end of the flap, the other end of the flap secured along its width dimension to the surface of the spread which is not exposed when the bed is made, the elastic strap adapted to extend around and over the upper surface of the mattress near the foot end thereof when the flap is wrapped around the foot end of the mattress.

4,389,745

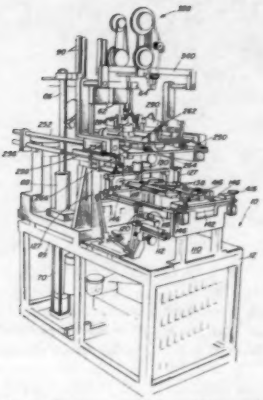
MOLDING AN INSOLE AND ATTACHING THE MOLDED INSOLE TO A LAST BOTTOM

Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed May 11, 1981, Ser. No. 262,665
Int. Cl.³ A43D *9/00*
U.S. Cl. 12—142 T **45 Claims**

1. A machine molding an insole and attaching the molded insole to a last bottom comprising: a lower mold; an upper mold, located above the lower mold, mounted for heightwise movement between an elevated position spaced from the lower mold and a lower position proximate to the lower mold; complementary molding surfaces on the top surface of the lower

mold and the bottom surface of the upper mold; means for initially maintaining the molding surfaces spaced from each other while a flat insole is transported between the molding surfaces; means for thereafter effecting relative closing movement between the molding surfaces to mold the flat insole to the shape of the molding surfaces; means for thereafter raising the upper mold to its elevated position; means for retaining the



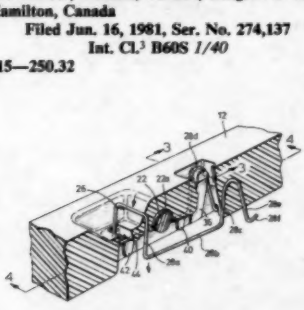
molded insole on the upper mold molding surface during the rise of the upper mold; means for thereafter placing a last supported bottom-up between the molds; means for thereafter releasing the molded insole from the upper mold molding surface to permit the molded insole to descend onto the last bottom; and means for thereafter attaching the molded insole to the last bottom.

4,389,746

CONNECTOR FOR WINDSHIELD WIPERS OF LOW SILHOUETTE TYPE

Edward G. Kimber, Carlisle, Canada, assignor to Tridon Limited, Hamilton, Canada

Filed Jun. 16, 1981, Ser. No. 274,137
Int. Cl.³ B60S 1/40
U.S. Cl. 15—250.32 **18 Claims**



1. A windshield wiper comprising:

a pressure distributing superstructure having at least a yoke member thereof of moulded plastic material;

the windshield wiper being of the type wherein a releasable connector between the superstructure and a wiper arm includes a pin extending sideways from the wiper arm and entering a cooperating transverse aperture in the said yoke member for the superstructure to pivot, the pin having a circumferential groove therein for releasable retaining engagement by a connector latch member mounted in an underside recess formed in the said yoke member;

wherein said underside recess is moulded in the underside of the yoke member and communicates through an aperture of reduced length with a counter recess moulded in the topside of the yoke member;

wherein a connector latch member is of spring wire material having two parallel transversely-spaced arms connected together at one end by a cross-member, which cross-member when the latch member is mounted in the yoke member is disposed in said counter-recess;

each arm comprising a number of arm portions connected together in the following order, namely,

a connecting portion connected to the said cross-member and extending from the counter-recess through the reduced length aperture into the said underside recess,

a pin-engaging portion connected to the connecting portion and extending lengthwise of the yoke member for releasable retaining engagement in the circumferential pin groove and for heightwise movement into and out of such engagement by corresponding movement of the cross member and the connecting portion;

a spring portion extending heightwise of the yoke member and flexing for said movement of the pin-engaging portion;

and a spring reaction portion also extending heightwise of the yoke member and engaging a wall of the underside recess to provide reaction for the said heightwise movement of the pin-engaging portion;

wherein the latch member during its maximum upward and downward movements remains always within the side profile of the yoke member and the cross-member does not protrude from the counter aperture, and

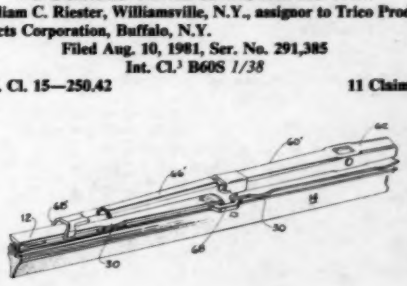
wherein the cross-member is moved downward within the counter aperture for releasable disengagement of the latch member pin-engaging portion from the said connector pin groove, the heightwise downward movement of the cross-member within the counter aperture until the cross-member enters the said aperture of reduced length being sufficient for the said releasable disengagement of the latch member and being insufficient to overstress the spring wire material of the latch member.

4,389,747

WINDSHIELD WIPER BLADE REFILL UNIT

William C. Riester, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,385
Int. Cl.³ B60S 1/38
U.S. Cl. 15—250.42 **11 Claims**



1. In a windshield wiper blade refill unit, including a squeegee element of elastomeric material having an elongate body portion terminating in a lip along one longitudinal edge and an anchoring strip along the other longitudinal edge separated from said body portion by a reduced neck portion and a stiff resilient supporting strip longitudinally coextensive with said squeegee element, said supporting strip including a hollow body for slidably receiving said anchoring strip having an upper wall, depending side walls and longitudinally slotted bottom wall for slidably receiving said neck portion, upper and lower lateral flanges coplanar with said upper and bottom walls, respectively, defining laterally open channels for slidably receiving and confining opposed claws of a wiper blade superstructure; retaining means for holding said superstructure and said refill unit assembled characterized in that each of said

side walls include a plurality of sets of openings longitudinally spaced apart along the supporting strip, each set comprising a pair of spaced apart openings in alignment with a like pair of spaced apart openings in the opposite side wall, and notches in said anchoring strip in alignment with said openings, said clip comprising a base portion and a pair of resilient legs extending forwardly from said base, said clip embracing a claw of a superstructure, said legs extending completely through a set of said openings and releasable latching means on said legs for retaining said clip in said openings to thereby accomodate superstructures having claws at different longitudinal positions relative to the supporting strip.

11. In a windshield wiper blade refill unit, including a squeegee element of elastomeric material having an elongate body portion terminating in a lip along one longitudinal edge and an anchoring strip along the other longitudinal edge separated from said body portion by a reduced neck portion and a stiff resilient supporting strip longitudinally coextensive with said squeegee element, said supporting strip including a hollow body for slidably receiving said anchoring strip having an upper wall, depending side walls and longitudinally slotted bottom wall for slidably receiving said neck portion, upper and lower lateral flanges coplanar with said upper and bottom walls, respectively, defining laterally open channels for slidably receiving and confining opposed claws of a wiper blade superstructure; retaining means for holding said superstructure and said refill unit assembled characterized in that said upper wall of said supporting strip and upper coplanar lateral flanges include longitudinally spaced apart laterally broadened areas to accomodate superstructures having opposed claws spaced apart a distance greater than other superstructures.

4,389,748

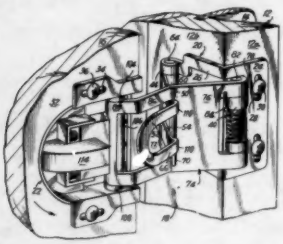
CONCEALED DOOR HINGE

Morris G. Grossman, #5 Horizon Rd., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 131,487, Mar. 13, 1980, and Ser. No. 93,448, Nov. 13, 1979, abandoned. This application May 26, 1981, Ser. No. 267,017

Int. Cl.³ E05D *3/06, 308, 3/10, 15/52*

U.S. Cl. 16—278 **90 Claims**



1. A hinge for mounting a door on a cabinet comprising:

an interior leaf, for mounting to a cabinet, including first and second pivots;

an external leaf including a third pivot for fixed positioning within a recess in a door;

a pivoting member having a first end pivotally connected to said second pivot, and a second end pivotally connected to said third pivot;

a forcing member having a first end pivotally connected to said first pivot, said forcing member being operatively associated with said pivoting member; and

forcing means urging said forcing member to interact with said pivoting member when said hinge is being moved to a closed position.

4,389,749

CUTTING-UP PROCESS

Kaarlo J. Korhonen, Säterivägen 18,, 161 70, Bromma, Sweden

Filed Dec. 23, 1980, Ser. No. 219,234

Int. Cl.³ A22C *17/02*

U.S. Cl. 17—46 **9 Claims**

1. In a process for coarse cutting-up of a carcass part comprising a limb, such as a shoulder part or a leg part, comprising separating a meat piece from a skeleton portion of the carcass part, wherein the meat piece comprises a major portion of the meat mass on the carcass part, the improvement including the steps of

gripping the foot-end of the limb and holding it against bending,

making incisions in the carcass part in a pattern adapted for the part while the part is being gripped,

cutting the meat piece away from the skeleton portion while the limb is held against bending, and

gripping the meat piece and subjecting it to a pulling force away from the carcass part during the cutting operation.

4,389,750

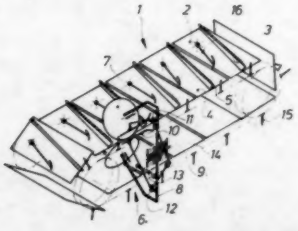
DEVICE FOR THE BEHEADING OF FISH

Sigurdur Kristinsson, Saudarkrokur, and Örn Johannesson, Reykjavik, both of Iceland, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,540

Int. Cl.³ A22C *25/14*

U.S. Cl. 17—63 **4 Claims**



1. Apparatus for mechanically decapitating fish, said fish having a head end, a tail end, two sides opposing each other intermediate said head end and said tail end, and a longitudinal axis extending between said head end and said tail end, said apparatus including

a. conveying means for conveying said fish in a conveying direction and defining a conveying plane, comprising a trough chain of receiving troughs having two end portions and a bottom surface to receive and convey said fish lying on one of said sides with their longitudinal axis essentially transverse to said conveying direction, and

b. decapitating means arranged at a close spacing beside one of said end portions of said receiving troughs and comprising pairwise arranged rotatingly driven circular knife means and feeler rail means, wherein said knife means are arranged symmetrically with respect to each other, including an angle with each other and being aligned by their plane of symmetry to be nearly parallel to the plane of said bottom surface of said receiving troughs whereby to provide a wedge-shaped cut through said fish, said feeler rail means being arranged symmetrically to the plane of symmetry of said knife means and displaceable synchronously by said fish against the force of spring means, and said knife means being mounted displaceably in height and operatively coupled with said feeder rail means for movement of said knife means in response to displacement of said feeder rail means to reposition said plane of symmetry of said knife means relative to said plane of the bottom surface of said receiving troughs by a distance sufficient to locate the juncture of said angularly-arranged knife means exactly at the longitudinal axis of the fish displacing said feeler rail means, regardless of the size of said fish.

4,389,751
APPARATUS FOR SEVERING A FIBRE LAYER OF STAPLE FIBRES

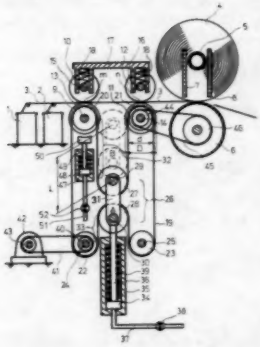
Paul Gyger, Seuzach, and Hugo Schär, Neftenbach, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

PCT No. PCT/EP80/00044, § 371 Date Mar. 9, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00118, PCT Pub. Date Jan. 22, 1981

PCT Filed Jul. 5, 1980, Ser. No. 243,933

Int. Cl.³ D01G *1/08;* D01H *5/86*

U.S. Cl. 19—0.35 **7 Claims**



1. An apparatus for severing a fibre layer composed of mutually slidable staple fibres, comprising:

two pairs of driven rolls;

said two pairs of driven rolls forming two nip lines for the fibre layer which is guided therebetween;

a flexible power transmitting element for kinematically coupling said two pairs of rolls;

each of said pairs of rolls containing a driven roll;

a respective drive roll provided for each driven roll of said two pairs of rolls;

at least two further deflecting rolls which are fixed relative to space and two rolls which are movable with respect to space;

means for interconnecting said two rolls to define a roll tandem;

said power transmitting element being guided about the drive roll of the driven roll of each pair of rolls and about said at least two further deflecting rolls which are fixed relative to space and about said two rolls which are movable with respect to space in such a manner that said power transmitting element forms a respective loop between the drive rolls and one of said rolls of said roll tandem and between the two deflecting rolls and the other roll of said roll tandem; and

one of said loops being shortened by a certain length whereas the other loop is lengthened by essentially the same length as the movable roll tandem is moved, so that one of said pairs of rolls can be rotatated relative to the other pair of rolls and the fibre layer clamped between the nip lines can thus be severed by being pulled apart.

4,389,752
METHOD OF PRODUCING A STAPLE FIBRE SLIVER AND APPARATUS FOR IMPLEMENTING THE METHOD

Emil Briner; Heinz Clement, both of Winterthur, and Heiner Eberli, Steckborn, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

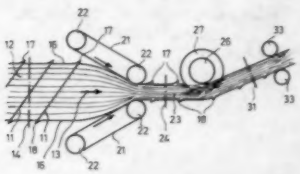
PCT No. PCT/EP80/00045, § 371 Date Mar. 10, 1981, § 102(e) Date Feb. 27, 1981, PCT Pub. No. WO81/00263, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 5, 1980, Ser. No. 243,917

Claims priority, application Switzerland, Jul. 10, 1979, 6409/79

Int. Cl.³ D01G *1/04, 1/06;* D01H *5/72*

U.S. Cl. 19—0.56 **8 Claims**



3. An apparatus for producing a draftable staple fibre sliver from a strand composed of endless, substantially parallel filaments and possessing a substantially elongate cross-sectional configuration and moved in a predetermined path of travel extending in the longitudinal direction of the strand, comprising:

means for laterally uniting and condensing the moving strand into a staple fibre sliver possessing a substantially circular cross-sectional configuration;

a rotatable rolling-in roll having an axis of rotation and containing a disc arranged along the path of travel of the staple fibre sliver possessing said approximately circular cross-sectional configuration; and

said rolling-in roll protruding into a predetermined region of a generatrix of said sliver containing forwardly protruding points for displacing said region together with said forwardly protruding points of said staple fibre sliver into the interior of the staple fibre sliver.

4,389,753
WEB TAKEOFF ROLL

Michael G. Golan, Amston, Conn., and Leo Desrosiers, Woonsocket, R.I., assignors to The Kendall Company, Walpole, Mass.

Filed Oct. 5, 1981, Ser. No. 308,431

Int. Cl.³ D01G *15/46*

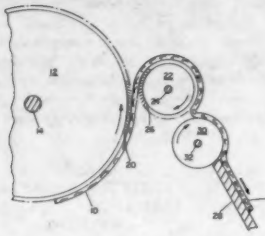
U.S. Cl. 19—106 R **3 Claims**

1. Carding cylinder takeoff apparatus for producing a randomized web of textile fibers, comprising

a rotatable doffing roll having a wire-covered surface for carrying thereon a fibrous web

a rotatable transfer roll having a wire-covered surface

closely spaced from said doffing roll surface for transferring said fibrous web from said rotatable doffing roll surface to said transfer roll surface to form fiber hooks in said web during said transferring to randomize said web, and



a rotatable takeoff roll closely spaced from said transfer roll surface and having a resilient rubber surface with a Shore A Durometer hardness of less than about 80 for removing said randomized web from said transfer roll.

4,389,754

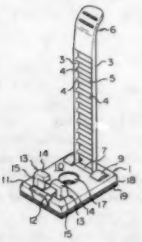
BINDING DEVICE

Yoshio Sohma, Tokyo, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 235,162

Int. Cl.³ B65D *63/10*

U.S. Cl. 24—16 PB **12 Claims**



1. A binding device comprising: a rigid base plate, a flexible ladder-like belt having a plurality of parallel spaced apart rungs provided between a pair of side rails thereof, said belt being hinged on an upper surface of said base plate near one end thereof, an outwardly inclined stopper formed at the opposite end of said base plate to protrude from the upper surface of said plate and away from said belt hinged point for selectively engaging one of said rungs, and a guide means provided on the upper surface of said plate between said hinged point and said stopper, being close to the stopper for use in guiding said belt toward the stopper permitting retention of the belt in binding position on the stopper.

4,389,755

MULTI-PURPOSE PAPER-WORK ORGANIZER CLIP INTEGRATED WITH ATTACHABLE DETACHABLE INFORMATIVE INDICIA

Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121

Filed Feb. 12, 1981, Ser. No. 233,913

Int. Cl.³ B42F *1/06*; G09F *3/02*

U.S. Cl. 24—67.9 **11 Claims**

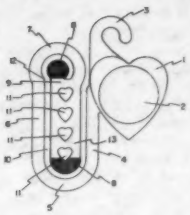
1. A unitary paper clip comprising:

a flat central member having at least one aperture therein;

raised ribs on upper and lower portions of said flat central member for engaging paper articles;

a hinge portion being connected to said flat central member in spaced relation thereto and having an arcuate slot therebetween;

said hinge portion having an upper curved flat portion, a first flat connecting arm, a lower flat arcuate member and



a second flat connecting arm, said upper flat portion, first flat connecting arm, lower flat arcuate member and second flat connecting arm being integral;

a lateral extension member connected to said hinge portion by said second connecting arm and adapted to receive informational or instructional indicia thereon; and

a hook member on said lateral extension for supporting said paper clip on any support member.

4,389,756

CLASP FOR SWIMMING ARTICLE

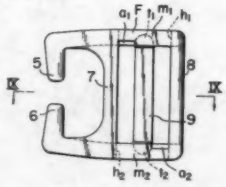
Masatoshi Kasama, Chiba, Japan, assignor to Kinugawa Pacific Kabushiki Kaisha, Japan

Filed Jan. 21, 1981, Ser. No. 226,595

Claims priority, application Japan, Jul. 23, 1980, 55-103216[U]

Int. Cl.³ A44B *11/10*

U.S. Cl. 24—171 **5 Claims**



1. A clasp for a swimming article which comprises

a frame member of substantially rectangular shape formed of a resilient material and having longitudinal slot recesses formed along two opposite sides of the frame member and further having two cutaway portions formed on the same side of the plane of the frame member and at diagonally opposite corners thereof and correspondingly communicating with the recesses, including means on the frame member for affixing it to a portion of said article and

a movable bar formed of a resilient material and whose opposite ends are adapted to slide in said recesses in the opposite sides of the frame member and which is adapted to be inserted into sliding position in the frame by passing the ends of the bar through the cutaway portions and into the recesses,

wherein the frame member and bar are dimensioned such that the effective length of the bar marginally exceeds the diagonal clearance of the frame member, whereby the resilience of the frame member and the bar allows the bar to be pressed and inserted into position, but the relaxed

shape of the frame member prevents the bar from being easily removed.

4,389,757

CONTROL LEVER SEAL

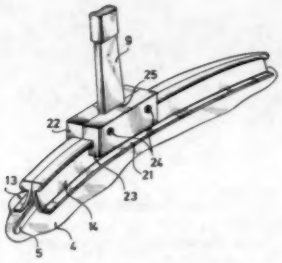
Karl-Heinz Luck, Dusseldorf; Albert Kallenberg, Hurth; Manfred Schnippering, Pulheim, and Herbert Moeselaken, Grevenbroich, all of Fed. Rep. of Germany, assignors to International Harvester Co., Chicago, Ill.

Continuation of Ser. No. 11,332, Feb. 12, 1979, abandoned. This application May 20, 1981, Ser. No. 265,137

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807819

Int. Cl.³ A44B *19/26*

U.S. Cl. 24—205.1 R **1 Claim**



1. In a device to seal a surface penetrated by a pivoted operating lever having a substantially constant cross-section along its length, which lever extends through a slot in the surface, a pair of sealing elements of flexible material secured to said surface, one on each side of said slot and normally engaging to seal said slot, and rims formed on said sealing elements; an improved closing element comprising:

a pair of mating sections;

a longitudinal rim groove formed in each section to accept said rims;

a lever groove in each section transverse to said rim groove and having a shape and size which is complementary to and slidingly engageable with said lever when said sections are connected around said lever;

said rim groove in each section angling toward the other section on each side of said lever groove;

a wedge formed on opposite ends of each section and positioned to protrude into the rim groove on the other section; and

releasable fastening means for connecting said sections around said lever whereby the rims are operated and closed around said lever, as it is pivoted, within said closing element, while allowing minimal contact with said lever.

4,389,758

ORNAMENTAL ATTACHMENT FOR SLIDE FASTENER SLIDERS

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,602

Claims priority, application Japan, Jun. 24, 1980, 55-88394[U]

Int. Cl.³ A44B *19/00*

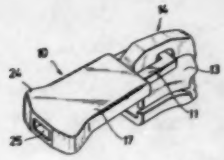
U.S. Cl. 24—205.11 R **9 Claims**

1. An ornamental attachment for a slide fastener slider with a pull tab, comprising:

(a) a body having a pair of spaced plates defining therebetween a channel for receiving therein the pull tab;

(b) a locking projection extending from one of said plates into said channel for locking the pull tab in said channel; and

(c) said one plate having a pair of laterally spaced slits communicating with and extending longitudinally of said channel to define therebetween a resilient web portion, said resilient web portion being connected at both opposite ends to said one plate and displaceable against the resiliency thereof away from the other plate in response to



engagement between the pull tab and said locking projection when the pull tab is inserted into said channel, until the pull tab becomes locked by said locking projection;

(d) both of said plates extending outwardly beyond said pull tab when locked in said channel and being connected together at their outward end portions.

4,389,759

RADIATOR GRILLE FIXING STRUCTURE

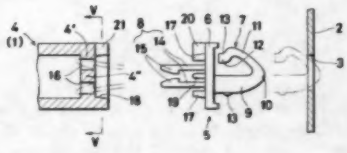
Takuo Yuda, Yokohama, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Sep. 10, 1980, Ser. No. 185,811

Claims priority, application Japan, Sep. 11, 1979, 54-124667[U]

Int. Cl.³ A44B *17/00*

U.S. Cl. 24—214 **1 Claim**



1. A radiator grille fixing structure comprising a plurality of separate fasteners adapted to engage an array of apertures in a grille and a matching array of apertures in a car body, each of said fasteners comprising:

(a) a base plate,

(b) a first engaging means extending from one side of said plate adapted to be snapped into one of said apertures in said car body, said first means being substantially hook-shaped and including;

(1) a solid shank portion with one end integrally formed with said base plate,

(2) a flexible curved arm extending from the opposite end of said shank portion, said arm having a stepped catch near its free end,

(c) a second engaging means extending from the opposite side of said base plate adapted to be snapped into engagement with one of said apertures in said grille, said second means including;

(1) a pair of resilient legs with oppositely directed hooks at the free ends thereof adapted to grip said grille,

(2) a rib on said base between said legs to abut and support a portion of said grilled engaged by said legs,

(3) tapering lateral support means disposed on said base and located radially outwardly from said legs to provide lateral contact between the fastener and the grille,

(4) a locating projection assymetrically disposed adjacent said support means to facilitate formation of a predeter-

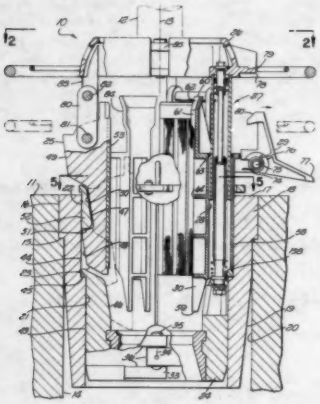
mined arrangement of said fasteners in said grille, whereby said fasteners support said grille in a fixed relation to said car body.

4,389,760

WELL SLIP UNIT

Igor Krasnov, Huntington Beach, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Dec. 7, 1979, Ser. No. 101,151
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—263 D **22 Claims**



1. A slip assembly comprising:

a support structure adapted to be supported on a well drilling rotary table in a relation to turn with the table;

a carrier structure mounted to said support structure for upward and downward movement relative thereto;

a plurality of slips which have inner faces for gripping a well pipe and which are connected to said carrier structure for movement upwardly and downwardly therewith relative to said support structure between lower active positions and upper retracted positions;

said slips having outer wedge surfaces for camming the slips inwardly into tight gripping engagement with a well pipe upon downward movement of the slips to said active positions;

latch means for releasably retaining said carrier structure and slips in said lower active positions; and

yielding means urging said carrier structure and slips upwardly and acting to return them to said upper retracted positions when said latch means are released;

said yielding means including a unit which is removable from said slip assembly for repair or replacement;

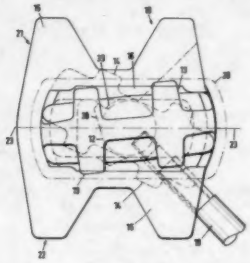
said unit including a vertically extending spring acting upwardly against said carrier structure and downwardly against said support structure to yieldingly urge the carrier structure upwardly relative to the support structure, a first element at the top of said spring urged upwardly thereby, a second element at the bottom of said spring urged downwardly thereby, and stop means acting when said unit is removed from said slip assembly to limit upward movement of said first element relative to said second element in a position maintaining said spring under compression.

4,389,761

CONTAINER COUPLING WITH SPLIT HOUSING

Jürgen F. G. Gloystein, Osterholz-Scharmbeck, and Klaus G. Szirniks, Bremen, both of Fed. Rep. of Germany, assignors to Conver Ingenieur-Technik GmbH & Co. KG, Bremen, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,687
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946509
Int. Cl.³ B63B *25/24*
U.S. Cl. 24—287 **7 Claims**



1. A coupling fitting for releasably locking adjacent corners of stacked shipping containers together, comprising:

(a) a housing **(10)** defined by two assembled, mating halves **(21, 22)** and having a central support flange **(15)** flanked by outwardly extending centering bosses **(16, 17)**,

(b) a central passage **(11)** extending through the flange and bosses for rotatably accommodating a locking bolt **(12)**,

(c) the housing being axially divided into the two halves by a central plane **(23)** passing through the flange and bosses, and having interfacing surfaces **(24, 25)**,

(d) undercut hook-like projections **(26)** extending outwardly from the interfacing surface of one housing half on one side of the passage and from each boss,

(e) first recesses **(27)** defined in the interfacing surface of the other housing half opposite the undercut projections and having configurations complementary thereto.

(f) tapering centering projections **(31)** extending outwardly from the interfacing surface of one housing half on another, opposite side of the passage and from each boss,

(g) second recesses **(34)** defined in the interfacing surface of the other housing half opposite the tapering projections of said one housing half recited in sub-paragraph (f), said recesses having configurations complementary to said tapering projections, and

(h) means for positively securing the tapering projections within their respective recesses upon assembly, whereby after assembly the projections and recesses are fully enclosed within the housing.

4,389,762

METHOD OF MAKING A TRIMMER CAPACITOR

Jeffrey R. Reeves, Marshall, Ill., assignor to TRW, Inc., Marshall, Ill.

Continuation of Ser. No. 70,102, Aug. 27, 1979, abandoned. This application May 1, 1981, Ser. No. 259,580
Int. Cl.³ H01G *5/12*
U.S. Cl. 29—25.42 **4 Claims**

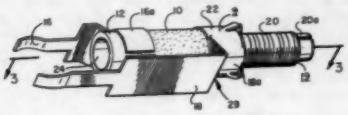
1. The method of making a variable capacitor having a tubular body comprising a rigid dielectric tube supporting axially-spaced capacitor electrodes on the outer wall of the tube and a metallic threaded cylindrical piston whose outer diameter is threaded and slightly smaller than the inner diameter of the tube, said body having an air-excluding intermediate liner for location between the tube and the piston comprising:

selecting for the intermediate liner a resilient resinous material deformable by cold flow and resistant to change in

dimension upon application of heat below 500° F., said material being of tubular form having an outer diameter too large to fit within the inner diameter of the dielectric tube,

axially stretching the tubular deformable material to reduce its outer diameter until its outer diameter fits within the rigid dielectric tube,

positioning the stretched tubular resinous material within the rigid dielectric tube along a substantial length of the rigid body, and



releasing the stretching forces on the tubular deformable material so that it tends to return to its former size and shape and is confined by the inner diameter of the rigid tube and conforms to the inner surface thereof, and

introducing said threaded metallic piston by threading the piston into the liner to deform the liner material by cold-flow and to form threads in said material precisely complementary to the threads of the metallic piston, and making electrical contact between said piston and one of said electrodes.

4,389,763

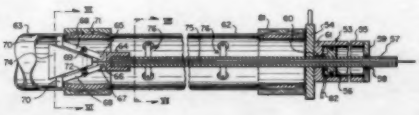
APPARATUS FOR JOINING PIPE SECTIONS BY JACKING

Richard O. Marsh, Jr., 703 Standard Life Bldg., Pittsburgh, Pa. 15222

Continuation-in-part of Ser. No. 967,965, Dec. 11, 1978, abandoned. This application Dec. 23, 1980, Ser. No. 219,514

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—237 **2 Claims**



1. Apparatus for joining a plain end pipe section to another through force fit couplings, said apparatus comprising a hydraulic jack having a cylinder and a piston operable therein, a hollow piston rod for said piston supported coaxially within said pipe section, a slotted plate member straddling said piston rod and interposed between said cylinder and coupling at one end of said pipe section, expansible means carried by said hollow piston rod and activated by a rod telescopically movable within said hollow piston rod for engaging a coupling at the opposite end of said pipe section, said piston being operable when subject to fluid pressure to apply a tension force through said piston rod and said expansible means to the last mentioned coupling and to simultaneously apply a reaction force to the coupling at said one end of the pipe section through said slotted plate member.

4,389,764

METHOD FOR THE PRODUCTION AND ASSEMBLY OF LOCK PARTS

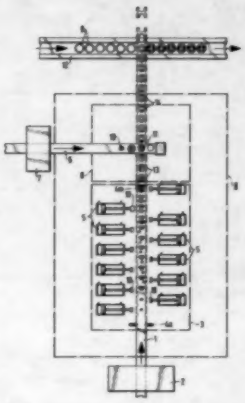
Walter Flander, Helsinki; Jukka Leikas, and Vesa Hirvonen, both of Joensuu, all of Finland, assignors to Oy Wartsila Oy, Helsinki, Finland

Filed Mar. 27, 1981, Ser. No. 248,296

Claims priority, application Finland, Apr. 1, 1980, 801037

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—416 **14 Claims**



1. A method for punching disc-like lock parts from a sheet band or the like and for combining them to form lock mechanism units determining different lock combinations, including the steps of:

arranging the punching of said parts to their final form in a series of punching actions carried out by a plurality of punching units;

punching of said parts with different details by having the pattern of said series changeable for each punching stroke; and

that in a final phase of said punching, separating said disc-like lock parts from said band and collecting said parts in an order determined by a pre-selected combination code.

4,389,765

PILING REMOVAL

Floyd M. Thompson, Jr., Spring, Tex., assignor to Crutcher Resources Corporation, Houston, Tex.

Filed May 4, 1981, Ser. No. 260,030

Int. Cl.³ B23P *19/00;* **B23B** *3/04;* **E21B** *29/00*

U.S. Cl. 29—426.5 **4 Claims**

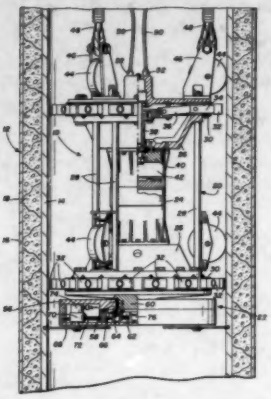
1. A method of removing a piling from a surrounding leg bonded to the piling, comprising the steps of:

breaking the bond interconnecting the piling and leg to free the piling;

lowering a clamp/cutter into the piling to a point located a predetermined distance below the upper end of the piling;

forming an internal circumferential cut through the piling with the cutter of the clamp/cutter to separate the piling into upper and lower portions;

actuating the clamp portion of the clamp/cutter to engage the upper portion of the piling; and



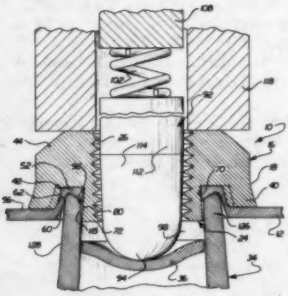
lifting the clamp/cutter and separated upper portion of the piling from the surrounding leg.

4,389,766

METHOD OF MOUNTING A FASTENER

Terry D. Capuano, Hinckley, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio

Filed Jun. 6, 1980, Ser. No. 157,221
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—432.2 **22 Claims**



1. A method of mounting a fastener having a center section with circumferentially spaced indentations located inwardly from a leading end of the center section, the center section projecting from a head section, said method comprising the steps of resiliently stretching a piece of sheet material independently of any force transmitted from the fastener to the sheet material, engaging the sheet material with the leading end of the center section of the fastener while the sheet material is stretched, cutting away a circular portion of the sheet material with the center section of the fastener to form an opening having a circular edge portion in the sheet material while the sheet material is stretched, and, thereafter, terminating said step of stretching the sheet material with at least a portion of the center section of the fastener in the opening to allow the circular edge portion of the opening in the sheet material to spring back into the circumferentially spaced indentations in the center section.

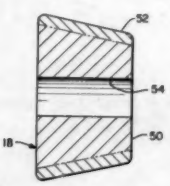
10. A method of mounting a fastener having a center section with circumferentially spaced indentations located inwardly from a leading end of the center section, the center section projecting from a head section, said method comprising the steps of providing a die having an opening with a minimum crosswise dimension which is less than a maximum cross sectional dimension of a center section of the fastener, engaging a first side of a piece of sheet material with the leading end of the center section of the fastener, engaging a second side of the piece of sheet material with the die, cutting away a circular portion of the sheet material by moving the leading end of the center section of the fastener through the sheet material into the opening in the die to form an opening having a circular edge portion, elastically decreasing the maximum cross sectional dimension of the leading end of the center section of the fastener as the center section of the fastener moves into the opening in the die by applying force against the leading end of the center section of the fastener with the die, engaging the center section of the fastener with the circular edge portion of the opening in the sheet material while the leading end of the center section of the fastener has a decreased cross sectional dimension and while the leading end of the center section of the fastener is disposed in the opening in the die, removing the leading end of the center section of the fastener from the opening in the die with the center section of the fastener extending through and disposed in engagement with the sheet material, and elastically increasing the cross sectional size of the leading end of the center section of the fastener as the leading end of the center section of the fastener is removed from the opening in the die to press the indentations in the center section of the fastener against the circular edge portion of the opening in the sheet material.

4,389,767

METHOD OF MANUFACTURING PULVERIZER ROLLS

Henry E. Burbach, Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 10, 1980, Ser. No. 214,847
Int. Cl.³ B22D *11/126*; B02C *15/04*
U.S. Cl. 29—527.1 **8 Claims**



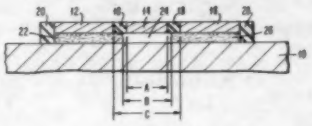
1. In a method of manufacturing a pulverizer roll of the type suitable for use in a bowl mill comprising the steps of forming a body having the overall configuration of a roll and providing a through passage through substantially the center of the body, the improvement comprising the steps of predicting the wear characteristics that the pulverizer roll is expected to experience based on the nature of the use to which the pulverizer roll is intended to be put, forming the outer surface of the body so that the contour thereof is a replication of the outer surface of a body that has actually experienced these predicted wear characteristics, and applying a layer of a hard material characterized by its wear-resistant qualities to the outer surface of the body.

4,389,768

SELF-ALIGNED PROCESS FOR FABRICATING GALLIUM ARSENIDE METAL-SEMICONDUCTOR FIELD EFFECT TRANSISTORS

Alan B. Fowler, Yorktown Heights; Robert Rosenberg, Peekskill, and Hans S. Rupprecht, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1981, Ser. No. 255,187
Int. Cl.³ H01L *21/225*
U.S. Cl. 29—571 **36 Claims**



1. In a method for fabricating a field effect transistor (FET) wherein a pair of diffusion sources are disposed on a semiconductor layer, and are spaced apart by a first distance, the steps of:

forming on said diffusion sources and, surrounding said diffusion sources at the peripheries thereof with insulation to provide an exposed region of said semiconductor layer between said diffusion sources, thereby defining a gate area having the length of said gate area less than said first distance;

driving said diffusion sources to provide a pair of doped regions in said semiconductor layer forming the source and drain of said FET, which source and drain, as a result of out-diffusion in the lateral direction, are spaced apart by a distance less than said first distance but greater than the length of said gate area; and

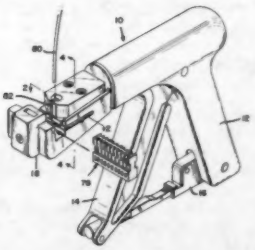
removing said diffusion sources to provide additional exposed regions of said semicondutor layer over said source and drain, all of said exposed regions being surrounded by insulation.

4,389,769

TERMINATING TOOL WHICH IS ADJUSTABLE TO ACCOMMODATE DIFFERENT CENTERLINE SPACING

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 24, 1981, Ser. No. 246,989
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—751 **10 Claims**



1. A hand tool for terminating individual conductors sequentially into respective insulation displacing conductor engaging portions of terminals preloaded into a connector housing, said hand tool comprising:

a frame having a hand grip, an actuation member pivotably mounted in the frame, and a drive shaft actuated by said actuating member;

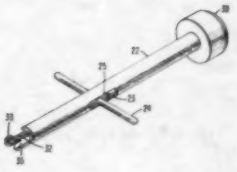
a terminating head mounted on said frame and having a transversely extending connector housing passing groove, a pawl assembly extending at least partly into one side of said groove to engage said housing for unidirectional movement thereof, advancement means extending into the opposite side of said groove and engageable with said connector housing to sequentially move it in a forward direction, means interconnecting said advancement means and insertion means including a yoke member one end of which is detachably secured to said drive shaft, first pin means securing said yoke member to said advancement means to coordinate the movements thereof and second pin means connecting conductor stuffing means selectively to said yoke member whereby a variation in the advancement of a connector housing through said tool to accommodate connectors having different centerline spacings of its terminals is accomplished by appropriate placement of said second pin joining said yoke member and said conductor stuffing means.

4,389,770

TRI-LEAD CABLE HOUSING REMOVAL TOOL

Terrance E. Bocinski, Binghamton, and Alan D. Knight, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,228
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—764 **5 Claims**



1. A tool for removing from a housing a tri-lead cable having end contact terminals removably latched to said housing and having a portion bonded to an encapsulating film which extends partially into said housing, said tool comprising:

a hollow elongated body member;

a spring-biased plunger mounted within said body member;

a spring hook blade attached to said plunger and biased by said plunger to normally extend out an open end of said body member, said spring blade being inserted in between said housing and film to hook onto an edge of said film; and

grasping means on said body member and connected to said spring-biased plunger for retracting said plunger and spring hook blade to unlatched and remove the hooked tri-lead cable from said housing.

4,389,771

TREATMENT OF A SUBSTRATE SURFACE TO REDUCE SOLDER STICKING

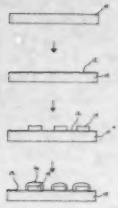
Michael P. Cassidy, Ewing Township, Mercer County; John F. D'Amico, Montgomery Township, Somerset County; Michael A. DeAngelo, Jr., Ewing Township, Mercer County, and Kon-Mang Lin, Hopewell Township, Mercer County, all of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,442
Int. Cl.³ H05K *3/02*
U.S. Cl. 29—846 **5 Claims**

1. A method of manufacturing a printed circuit comprising the steps of:

(a) forming a circuit pattern on a flexible rubber modified epoxy coated printed circuit substrate;

(b) mechanically roughening at least that portion of the substrate not having or not to have a circuit pattern thereon either before or after the formation of said pattern



by means which result in roughening equivalent to roughening with a 125–400 mesh grit; and

(c) flowing solder over the circuit board so as to cause solder to coat only the circuit pattern.

4,389,772

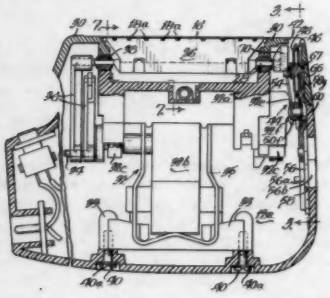
ELECTRIC DRY SHAVER

Donald J. Coleman, Lisle; Wilbur C. Jackson, Wheaton; Robert R. Lube, Countryside, and Albert R. Spohr, Park Ridge, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jun. 27, 1980, Ser. No. 163,743

Int. Cl.³ B26B *19/12*

U.S. Cl. 30—43.9 **7 Claims**



1. An electric shaver including an improved long hair clipper comprising a housing enclosing a motor drivingly connected to a shaving head mounted on a wall of said housing, said head having an arched comb and oscillating cutting means in shearing engagement with said comb, an oscillating shaft mounted for oscillation about its axis and disposed beneath said comb for supporting said cutting means for oscillation about said shaft axis, said shaft being connected to be oscillated by said motor, a long hair clipper assembly mounted adjacent one end of said oscillating shaft for linear slidable movement between a retracted position within said housing to an exposed position in which a portion of said assembly projects outside of said housing, said clipper assembly including a comb having teeth formed along one edge thereof, a support member secured to said comb and having guiding portions which engage portions of said housing to control the linear sliding movement of said clipper assembly, a cutter supported on said comb with teeth on one edge thereof, means biasing said cutter into engagement with said comb whereby said comb and said cutter teeth are in shearing engagement, detent means for retaining said assembly in either said retracted or said exposed position, said comb and said cutter being flat planar members having transverse bearing portions formed thereon for supporting said comb and cutter for relative sliding engagement, said support member being molded onto said comb to enclose a portion thereof, said support member including a transverse rib received within a transverse channel formed on said cutter to guide said cutter for linear movement with respect to said comb, and said means biasing said cutter being mounted on said support member, means on said cutter and said oscillating shaft which drivingly interconnects said shaft with said cutter to reciprocate said cutter when said clipper assembly is in said exposed position.

4,389,773

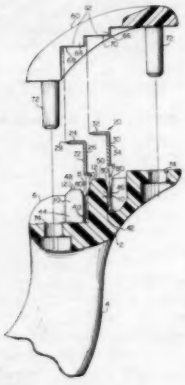
SHAVING IMPLEMENT

Warren I. Nissen, Topsfield, and Richard J. Petrillo, Norwell, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Apr. 30, 1981, Ser. No. 258,936

Int. Cl.³ B26B *21/02*

U.S. Cl. 30—50 **12 Claims**



1. A shaving implement comprising a platform member having slot means therein and support means adjacent said slot means, said support means having thereon support surface means generally normal to said slot means, blade means comprising a blade member having first and second portions generally normal to each other, said first portion having a cutting edge thereon, and a cap member having support means, said cap member support means having thereon support surface means, said blade member second portion being disposed in said slot means, said blade member first portion being clamped permanently and immovably between said platform member support surface means and said cap member support surface means, said cap member being permanently joined to said platform member.

4,389,774

ASPIRATING CUTTER FOR CUTTING AND ASPIRATING FILAMENTARY MATERIAL

William D. McLaughlin, Jr., Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Filed Jul. 9, 1981, Ser. No. 281,813

Int. Cl.³ B23D *17/06*

U.S. Cl. 30—133 **9 Claims**

1. An aspirating cutter for severing traveling filamentary material and exhausting same to a remote location, comprising:

a housing,

a hollow suction tube projecting forwardly from said housing, and being open at its front end,

said suction tube including at least one generally longitudinally extending first cutting edge at the outer periphery of said suction tube,

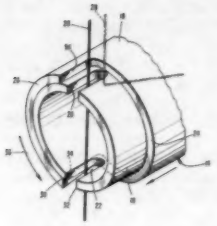
means for generating a rearward suction in said suction tube,

an outer tube mounted on the outside periphery of said suction tube and being co-axial with the latter,

said outer tube including a generally longitudinally extending second cutting edge at an inner periphery of said outer tube and spaced circumferentially from

said first cutting edge in a non-cutting mode to form therebetween a receiving space for receiving traveling filamentary material,

said space being disposed at a downstream side of said suction tube with reference to the direction of travel of the filamentary material,



one of said suction tube and outer tube being mounted for rotation relative to the other about said longitudinal axis, and

means for rotating said one tube to converge said first and second cutting edges into a cutting mode to sever a downstream portion of the filamentary material such that the severed filamentary material becomes entrained within the suction flow in said suction tube,

the front end of said one tube being circumferentially recessed to avoid contact of said one tube with previously severed filamentary material being exhausted in said suction flow while non-severed filamentary material is being subsequently severed by said cutting edges.

4,389,775

BELT BUCKLE AND KNIFE

Walter W. Collins, 802 Bellwood St., Clover, S.C. 29710

Filed Jul. 22, 1981, Ser. No. 286,052

Int. Cl.³ B26B *3/06*; A45F *5/00*

U.S. Cl. 30—156 **16 Claims**

1. A knife and case comprising:

a knife blade having first and second side surfaces;

a handle pivoted to one end of said blade for pivoting from a closed position in which the handle overlays the first side surface of said blade to an open position in which the free end of the handle extends away from the free end of the blade;

a case, said case including blade receiving means for receiving the blade when the handle is in the open position and for permitting pivoting of the handle relative to the received blade;

attachment means for securing the received blade to said case upon pivoting the handle from the open to closed positions and for releasing the received blade from the case upon pivoting the handle from the closed to open positions, to thereby releasably secure the knife to the case.

4,389,776

REPLACEABLE BLADE TYPE KNIFE

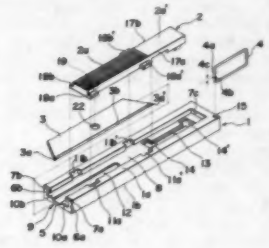
Saburo Okada, Osaka, Japan, assignor to Okada Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 12, 1981, Ser. No. 272,896

Claims priority, application Japan, Sep. 12, 1980, 55/130886[U]

Int. Cl.³ B26B *1/08*

U.S. Cl. 30—162 **4 Claims**



1. A replaceable blade type knife which comprises:

a tubular case body having guide grooves formed along longitudinal side edges thereof, said guide grooves being formed with an opening at a longitudinal forward end of said body;

a blade having a cutting edge along one longitudinal side thereof, said blade being axially, slidably fitted into said guide grooves of said case body so as to be selectively projected from and retracted into said opening of said case body in a longitudinal direction;

a sliding member provided with a bearing surface to be depressed by a finger of an operator, and slidably fitted into said guide grooves of said case body, said blade being interposed between said case body and said sliding member so that said sliding member is guided together with said blade in one unit in said guide grooves of said case body within a predetermined guide stroke;

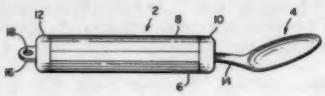
restrictive means for enabling dismounting of said sliding member from said guide grooves of said case body at a specific position within said guide stroke of said sliding member between the opposite ends of said guide stroke and for unreleasably holding said lifting member in said guide grooves of said case body at positions other than said specific position so as to allow said sliding member to slide in said guide grooves of said case body, said restrictive means comprising recess portions formed in said case body and boss portions so formed on said sliding member as to be fitted into said recess portions when dismounting said sliding member; and

coupling means for releasably coupling said sliding member to said blade so that said sliding member and said blade are slidably guided in one unit in said guide grooves of said case body, whereby a longitudinal forward edge of said blade is selectively and slidably projected from and retracted into said open end of said case body in a longitudinal direction, with said sliding member being arranged to be dismounted from said blade at least at said specific position.

4,389,777
EATING UTENSIL FOR USE BY THE MANUALLY IMPAIRED

David Landsberger, 60 Hibernia Rd., Rockaway, Morris County, N.J. 07866

Filed Jul. 2, 1981, Ser. No. 279,715
Int. Cl.³ A47G 21/04
U.S. Cl. 30—324 7 Claims

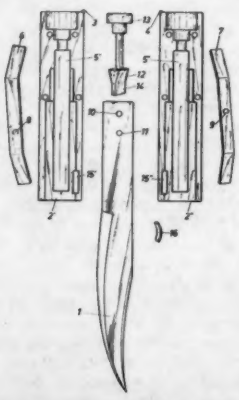


1. An eating utensil for a manually impaired user, comprising:
- a substantially hollow, cylindrical handle having a base section and a cover section which fits over the base section, and the handle being sized to facilitate grasping of the utensil by the user;
- a functional member having an elongated stem;
- means included within the base section for retaining the elongated stem so that said stem extends longitudinally along the axis of the base section;
- a pair of end caps, each of which is in cooperative arrangement with an opposite end of the handle when the cover fits over the base section for removably retaining the cover and base section together; and
- the cover and base section arranged so that the stem of the functional member is captured within the hollow cylindrical handle when the cover and base section are removably retained together by the end caps, with the functional member thereupon extending along the axis of the handle and external thereto from an end thereof.

4,389,778
DEVICE FOR KNIFE HANDLE

William Håkansson, Åmål, Sweden, assignor to Aktiebolaget Metka, Åmål, Sweden

PCT No. PCT/SE80/00156, § 371 Date Dec. 17, 1980, § 102(e) Date Dec. 17, 1980, PCT Pub. No. WO80/02816, PCT Pub. Date Dec. 24, 1980
PCT Filed May 29, 1980, Ser. No. 227,095
Claims priority, application Sweden, Jun. 29, 1979, 7905049
Int. Cl.³ B25G 3/28
U.S. Cl. 30—338 2 Claims

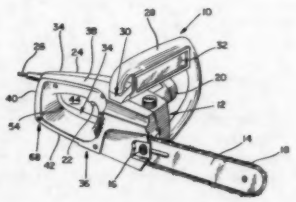


1. A knife handle capable of firmly holding a detachable knife blade having a substantially flat side with a set of openings therein, said handle comprising two spring leaf means for bearing against the flat side of said knife blade, said spring leaf means having protrusions which engage the set of openings in said knife blade, said openings corresponding to the positions of said protrusions, said knife handle including control means for applying pressure between said spring leaf means to disengage said protrusions from said corresponding knife blade openings, wherein said control means includes a wedge means displaceable in said handle for forcing apart said spring leaf means, wherein the maximum displacement of said wedge means displaces said knife blade in a direction parallel to the displacement of said wedge means to leave said knife blade openings in a position which does not correspond to said protrusions.

4,389,779
RIBBED HANDLE AND GUARD CONSTRUCTION FOR CHAIN SAW

Douglas G. Overbury, and Robert J. McDougall, both of Brockville, Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 18, 1980, Ser. No. 251,721
Int. Cl.³ B27B 17/02
U.S. Cl. 30—382 8 Claims



1. A clamshell housing for a power tool comprising:
- (a) a support member having the power tool affixed thereto,
- (b) an open section of predetermined width formed on the support member,
- (c) a cover member detachably connected to enclose the open section of the support member, and to define a parting line therebetween,
- (d) the cover member having a width at least three times greater than the width of the open section,
- (e) the cover having a continuous smooth surface on one side thereof,
- (f) a plurality of stiffening ribs extending from the underneath side of said surface transversely across the width thereof to support and stiffen the cover, and
- (g) fastening means connecting the cover to the open section of the support member.

4,389,780
BAG OPENING DEVICE FOR CAN OPENERS

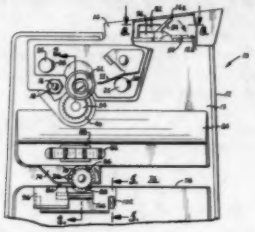
Richard J. Ostroski, Jackson County, Mo.; James B. Aberer, Contra Costa County, Calif., and Gary Best, Jackson County, Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.

Filed May 30, 1980, Ser. No. 154,785
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.³ B21D 53/50
U.S. Cl. 30—408 4 Claims

1. In a power operated can opener having an upright frame, a can feed wheel rotatively mounted on said frame, a hand lever, a cutting element mounted on said lever, means mounting said hand lever on the frame for movement to carry the cutting element toward and away from the can feed wheel, and

power means for effecting rotation of said feed wheel, the combination therewith of:

a bag cutter wheel mounted for rotation on said frame at a location offset from the can feed wheel, said cutter wheel having a peripheral edge formed to cut through a sealed bag containing food when the bag is fed past the cutter wheel in operating cutting proximity therewith;



guide means on the frame adjacent said peripheral edge for guiding the bag as same is being fed past the cutter wheel; and

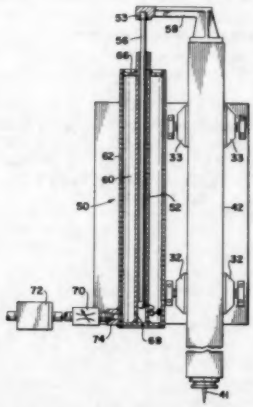
a retainer element removably mounted on said frame at a location to partially overlap the peripheral edge of said cutter wheel.

4,389,781

PNEUMATIC COUNTERBALANCE FOR A COORDINATE MEASURING MACHINE

Robert D. Donaldson, West Carrollton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 10, 1981, Ser. No. 291,526
Int. Cl.³ G01B 5/20
U.S. Cl. 33—1 M **15 Claims**



1. In a coordinate measuring machine (10), including a base (20), a carriage (30) for movement relative thereto, a probe arm (42) and a probe (41) disposed at the free end of said probe arm (42) for engaging an article to be measured, characterized by:

a pressurized pneumatic accumulator (60);

a cylinder (52) having one end in free communication with said pneumatic accumulator (60) and the other end vented to atmosphere:

a piston (54) disposed within said cylinder (52) for relative movement therein and permitting pressurized air to leak around;

connecting means (56,58) connecting said piston (54) to said probe arm (54) for movement together;

a regulated air supply (72); and,

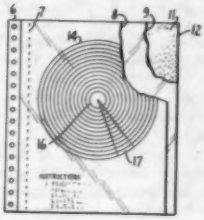
variable flow control valve (10) connecting said regulated air supply (72) to said accumulator (60) and being adjusted to balance for leakage past said piston (54) at a selected pressure.

4,389,782

DETERMINATION OF THE EXTENT OF A DECUBITUS ULCER

David F. Webster, Santa Rosa, Calif., assignor to Nomode Incorporated, Santa Rosa, Calif.

Continuation of Ser. No. 113,051, Jan. 17, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,939
Int. Cl.³ G01B 3/00
U.S. Cl. 33—1 BB **3 Claims**



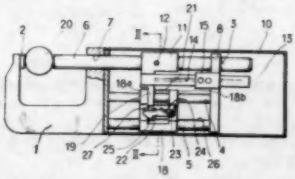
1. A device for recording the extent of a decubitus ulcer on the skin of a patient comprising a transparent barrier sheet having a top face and a bottom face with an adhesive on the bottom face for securing the barrier sheet in position over an ulcerated region on a patient, and a transparent outer sheet removably positioned over the top face of the barrier sheet, said outer sheet having a plurality of spaced concentric rings arranged concentrically about a central eye which is positioned in use over the central portion of the skin lesion provided by a decubitus ulcer.

4,389,783

MEASURING DEVICE

Hideo Sakata, and Seigo Takahashi, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Mitutoya Seisakusho, Tokyo, Japan

Filed Dec. 2, 1980, Ser. No. 212,133
Claims priority, application Japan, Dec. 5, 1979, 54-157577
Int. Cl.³ G01B 5/02
U.S. Cl. 33—143 K **5 Claims**



1. A measuring device for measuring a linear dimension of a workpiece wherein the linear dimension is measured between two opposed sides of the workpiece, the measuring device comprising:

a frame having an anvil portion and supporting portion wherein the workpiece is positioned with one side against the anvil portion and the other side adjacent to the supporting portion;

a first adjustable element having a surface thereon for engaging the other side of the workpiece;

means for reciprocally mounting the adjustable element on the supporting portion of the frame with the workpiece engaging surface positioned opposite the anvil portion of the frame whereby the workpiece is disposed between the anvil portion and workpiece engaging surface during utilization of the measuring device;

a second adjustable element reciprocally mounted on the frame for motion paralleling that of the first adjustable element, the second adjustable element having a pair of opposed surfaces defining a space therebetween;

a depending portion on the first adjustable element positioned between the opposed surfaces;

spring means disposed between the depending portion and one of the opposed surfaces for biasing the first adjustable element toward the anvil;

ratchet means disposed between the second adjustable element and the frame for preventing movement of the second adjustable element in a direction away from the anvil portion while permitting movement in a direction toward the anvil portion while the ratchet means is engaged;

means for normally holding the ratchet means engaged;

handle means for releasing the ratchet means and for reciprocating the second adjustable element with respect to the anvil, and

means on the frame for indicating the distance between the anvil portion and workpiece engaging surface of the first adjustable element to thereby display the linear dimension of the workpiece when the workpiece is disposed between the anvil portion and workpiece engaging surface;

whereby,

when the workpiece is disposed between the anvil portion of the frame and the workpiece engaging surface of the first adjustable element, the spring means exerts the force necessary to keep the workpiece engaging surface in abutment with the side of the workpiece and thus isolates the holding force from that provided by the measurer.

4,389,784

COMPARATOR WITH PIVOTING FEELER

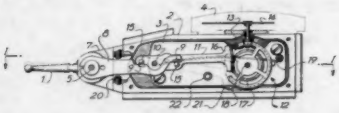
Adriano Zanier, Prilly, Switzerland, assignor to Tesa, S.A., Renens, Switzerland

Filed Sep. 21, 1981, Ser. No. 303,719

Claims priority, application Switzerland, Oct. 2, 1980, 7352/80

Int. Cl.³ G01B *3/22*

U.S. Cl. 33—172 B **4 Claims**



1. A comparator with pivoting feeler comprising:

pivoting lever means for the transmission of the movements of said feeler;

a displacement amplifying device driven by said pivoting lever means;

an indicator member controlled by said amplifying device to permit reading values representing the movements of said pivoting feeler;

spring means for urging said pivoting lever means into a rest position;

end-of-stroke stop means for limiting the pivotal movement of said pivoting lever means from said rest position; and

coil spring means having two fixed ends and a free portion therebetween, said coil spring means being arranged on the path of said pivoting lever means at a distance from said rest position and said end-of-stroke stop means with its axis perpendicular to the plane of pivoting of said pivoting lever means.

4,389,785

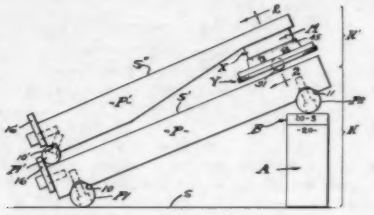
SINE-BAR GAGE-BLOCKS AND DIRECT READING MICROMETER ADJUSTMENT

Wesely R. Goldsmith, 3383 Moore St., Mar Vista, Calif. 90066, and Joel E. Di Marco, 4288 Revere Pl., Culver City, Calif. 90230

Filed Dec. 15, 1980, Ser. No. 216,657

Int. Cl.³ G01B *3/18, 3/30*

U.S. Cl. 33—174 S **13 Claims**



1. In combination, a primary sine-bar having spaced parallel plugs and one plug supportably engaged upon a first surface plane and the other plug displaced from said surface plane in even degree increments by means of at least one gage-block in each instance and establishing a second surface plane of angularity, a secondary sine-bar having a plug parallel to the parallel plugs of the primary sine-bar and supportably engaged upon the second surface plane, and a micrometer spaced from the supportably engaged plug of the secondary sine-bar and comprising an anvil extended by a thimble threadedely engaged upon a barrel of uniform thread pitch depending from the secondary sine-bar for adjustably engaging the anvil with said second surface plane of the primary sine-bar, the thimble being calibrated in minutes of sine-bar angularity within one degree as related to an index line on the barrel.

4,389,786

CONTOUR MEASURING INSTRUMENT

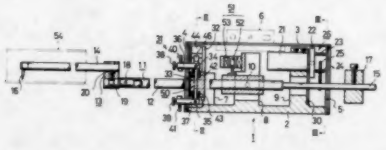
Hideo Sakata, Oomiya, and Seigo Takahashi, Machida, both of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1981, Ser. No. 250,484

Claims priority, application Japan, Apr. 18, 1980, 55-52098

Int. Cl.³ G01B *7/28*

U.S. Cl. 33—174 P **13 Claims**



1. In a contour measuring instrument for measuring the contour of a surface of a workpiece, the combination comprising: an instrument body; an elongated arm supported on said body for pivotal movement about a pivot axis which extends transverse to said arm so that said arm can pivot in clockwise and counterclockwise directions; a stylus attached to one end of said arm and adapted to contact the surface of the workpiece and to be traversed thereacross to trace the contour of that surface; weight means on said arm for balancing said arm; an arm rotation value detecting means coupled to said arm for detecting the extent of pivotal movement of said arm caused by displacement of said stylus as said stylus is traversed across the

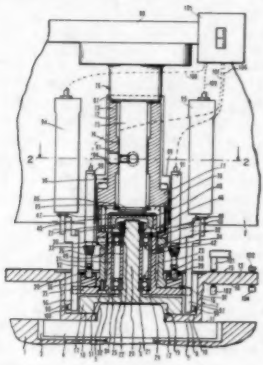
surface of the workpiece; a drive mechanism for forcibly pivoting said arm about said axis in a direction to move said stylus away from the surface of the workpiece; and an arm turning angle detecting mechanism responsive to forcible pivoting of said arm by said drive mechanism through a predetermined angle and coupled to said drive mechanism to stop operation of said drive mechanism whereby to prevent said arm from pivoting through an angle larger than said predetermined angle and thereby prevent said stylus from moving farther away from the surface of the workpiece.

4,389,787

GAUGE FOR THE GEOMETRICAL AND/OR DIMENSIONAL CHECKING OF PIECES ROTATING ABOUT A GEOMETRICAL AXIS

Sergio Solaroli, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed May 15, 1981, Ser. No. 264,217
Claims priority, application Italy, May 16, 1980, 3427 A/80
Int. Cl.³ G01B 7/12, 7/28
U.S. Cl. 33—174 Q **10 Claims**



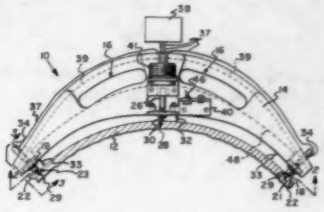
1. A gauge for the geometrical and/or dimensional checking of pieces rotating about a geometrical axis, the checking being made with reference to a part of the piece adapted to define a determined geometrical surface, comprising: a frame; piece supporting means carried by the frame for making the piece rotate about said axis; an element—supported by the frame—that rotates, together with the piece, about said axis, the element being adapted to cooperate with the piece in order to locate said geometrical surface with continuity during rotation; gauging means, supported by the frame, including measuring heads adapted to provide signals representative of the position of said geometrical surface, depending on the position of the element; and a reference structure supported by the frame and adapted to cooperate with said element and with the measuring heads, the reference structure including a reference device, first connection means for coupling the element to the reference device and for permitting the relative of the element with respect to the reference device, and second connection means for connecting the reference device to the frame, and for keeping the reference device in a pre-determined position with respect to said geometrical surface, said measuring heads being adapted to cooperate with the reference device.

4,389,788

APPARATUS AND METHOD FOR MEASURING ROLL DIAMETERS

Louis J. Balogh; Raymond L. Fitzhugh, both of Akron; Dale S. Kimes, Wadsworth, and Myron Weinstein, Munroe Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 7, 1981, Ser. No. 290,845
Int. Cl.³ G01B 5/08, 7/12
U.S. Cl. 33—178 D **12 Claims**



1. Apparatus for measuring the variation in diameter of a generally cylindrical body comprising:

a frame member having spaced-apart support means for engaging the surface of said cylindrical body,

a primary sensor positioned between said support means on said frame member to determine the position of the surface of said cylindrical body relative to said frame member at a first point for measuring the approximate variation in diameter of said body, and

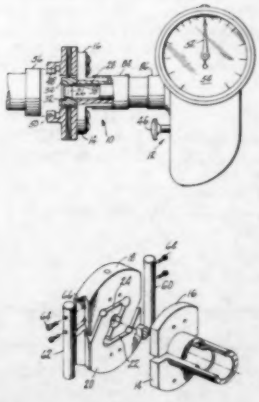
at least one secondary sensor positioned on said frame member adjacent one of said support means to determine the position of the surface of said cylindrical body relative to said frame at a second point for measuring a correction to the approximate diameter variation measurement.

4,389,789

CONTRACTING MICROMETER RING GAGE ASSEMBLIES

Franklin Meyer, Jr., Forestdale, R.I., assignor to Comtorgage Corporation, Slatersville, R.I.

Filed Oct. 26, 1981, Ser. No. 314,984
Int. Cl.³ C01B 3/34
U.S. Cl. 33—178 R **9 Claims**



1. A ring gage assembly adapted to be coupled to an indicating device, comprising a pair of separate but relatively mov-

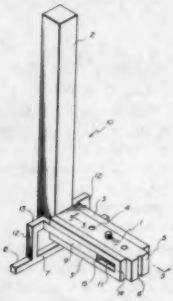
able interconnected gaging members each having a measuring surface remote from the indicating devices and each including a projection in a plane located between the indicating device and the measuring surfaces, each projection being interdigitated with the similar projection on the other gaging member and also including an indentation forming with a corresponding indentation in the opposite projection a generally central socket, a spring-pressed plunger having a tapered tip normally urged into engagement with the socket to cause the measuring surfaces to approach each other in embracing relationship with a workpiece and means for coupling the plunger to the indicating device.

4,389,790

DRILL GUIDE

Alvin E. Dunlap, P.O. Box 861, Folsom, Calif. 95630

Filed Apr. 16, 1981, Ser. No. 254,691
Int. Cl.³ B23B 47/28, 49/00
U.S. Cl. 33—185 R 10 Claims



1. A drill guide for accurate placement of bolt holes on a mud sill or the like comprising in combination;

a guide block having at least one bore therethrough adapted to receive a drill bit for accurate bore placement on the mud sill,

an upright, orthogonal to said guide block to assure perpendicularity of the bores,

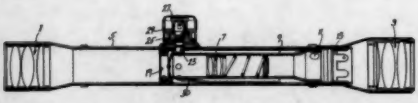
and means to yieldingly connect said upright to said guide block and to maintain said upright orthogonal to said guide block during a range of relative movement whereby the distance between said guide block and said upright can be varied to accommodate sills of different dimensions along with an associated underlying slab and a placement marker extending up from the slab wherein said upright includes portions above and below said guide block whereby said portion below can abut against the sill.

4,389,791

RANGE-FINDING TELESCOPIC SIGHT

William R. Ackerman, El Paso, Tex., assignor to W. R. Weaver Co., El Paso, Tex.

Filed May 4, 1981, Ser. No. 260,246
Int. Cl.³ F41G 1/38; G01C 9/02
U.S. Cl. 33—246 8 Claims



1. In a telescopic sight of the type comprising an objective lens set, an ocular lens set, an erector lens set disposed between said objective and ocular lens sets, a first reticle, fixed in the rear focal plane of the sight; the improvement comprising in combination:

(a) a second reticle fixed in the front focal plane of the sight;

(b) means for controllably displacing the image of said second reticle formed in said rear focal plane operable to bracket a target of known size between said first reticle and said image of said second reticle, said displacing means further including means for indicating the range to said target; and

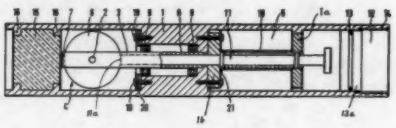
(c) means integral with said displacing means for shifting the target image in said rear focal plane subsequent to determining the range to compensate for predetermined bullet drop over the range indicated by said displacing means.

4,389,792

DRILL CORE INCLINOMETER

Heinz Fuchs, Recklinghausen, Fed. Rep. of Germany, assignor to Ruhrkohle A G, Essen, Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,402
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1980, 3000319
Int. Cl.³ E21B 47/022; G01C 9/14
U.S. Cl. 33—304 7 Claims



1. Device for measuring vertical and transverse inclination of drill cores which are removed from below ground via a core barrel, comprising a hollow cylindrical member having sealed axial ends and being adapted to be releasably mounted in the core barrel; a gravity-oriented inclination measuring device mounted in said member for turning movement about two mutually normal axes; and arresting means for arresting said device against said turning movement at a predetermined time prior to removal of the drill core from a bore hole, said measuring device including a first shaft extending lengthwise in said member journalled therein turnable about one of said axes and having a bifurcated leading end portion, an eccentrically weighted wheel, and a second shaft mounting said wheel on said leading end portion turnable about the other of said axes, said first shaft having a longitudinal passage extending from said leading end portion to a trailing end of the first shaft; said arresting means comprising a piston having one portion slidable in said passage and provided with a free end face engageable with said wheel to prevent turning of the same.

4,389,793

WHEEL ALIGNMENT APPARATUS

Louis L. Butler, 12489 Lockhaven Ave., Baton Rouge, La. 70815

Filed Feb. 26, 1981, Ser. No. 238,407
Int. Cl.³ G01B 5/24
U.S. Cl. 33—336 6 Claims

1. In an improved wheel alignment apparatus for the measurement in four-wheeled, tired, automotive vehicles of caster, camber, toe, steering axis inclination, and track of the front and rear wheels, while the tired wheels of said vehicle are setting upon parallel aligned runways, a right and left runway, defining a reference plane and direction of orientation for said vehicle, the combination which comprises

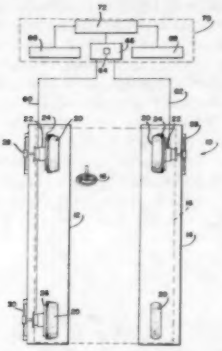
a tire contact wheel clamp inclusive of an elongate wheel bar at each terminal end of which is located a laterally projecting wheel bar clamp for operative contact of the inner face thereof with the alternately disposed outer edges of a tire, one for horizontally mounting on the outer side of each right and left front wheel, and at least one other for horizontally mounting on the outer side of a rear wheel,

orthogonally related gravity sensing electronic transducers mounted on the elongate wheel bar of each tire contact wheel clamp, one mounted at a right angle to the elongate wheel bar, and another mounted parallel to the elongate wheel bar,

a flag assembly, one for each tire contact wheel clamp, inclusive of a sliding member slidably mounted on a shaft parallel with a runway connected via linkage to a flag bar mounted parallel to said shaft for contact with a toe sensor plunger and toe calibration adjustment screw located in circuit with the gravity sensing electronic transducers,

electrical cables connected to and extending from each orthogonally related gravity sensing electronic transducer providing multiplexed electrical circuits,

a deck switch associated with each of said multiplexed electrical circuits, providing electrical means for selectively



switching from one multiplexed electrical circuit to another,

logic means electrically coupled via electrical cables to said deck switch,

an electrical generator which provides voltage signals over the electrical cables to each of the gravity sensing electrical transducers, the electrical transducers when associated with a multiplexed electrical circuit via selective manipulation of the deck switch to transmit to the logic circuit an output voltage proportional to tilt angle of caster, camber, toe, steering axis inclination, and track of said wheels, and

read out means for numerical interpretation and display of the signals transmitted from said gravity sensing electronic transducers to said logic means in terms of caster, camber, toe, steering axis inclination and track of said wheels.

4,389,794

VACUUM CHAMBER AND METHOD OF CREATING A VACUUM

Jack G. Bitterly, 4723 Vista De Oro Ave., Woodland Hills, Calif. 91367

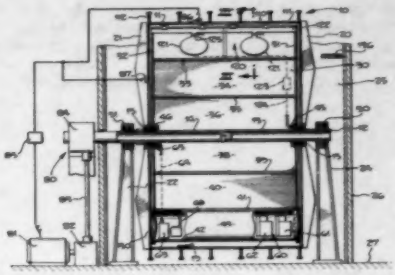
Filed Dec. 23, 1980, Ser. No. 220,004

Int. Cl.³ F26B *5/06;* **A23G** *9/00;* **F01B** *31/00;* **F27B** *5/04*

U.S. Cl. 34—5 **34 Claims**

23. In a vacuum chamber having an airtight chamber, vacuum means for evacuating the chamber and condenser means for condensing condensables from the product in the chamber, the improvement comprising:

means associated with the condenser means for increasing the gravitational forces on the condenser means to increase the rate at which the condensables condense thereon.



4,389,795

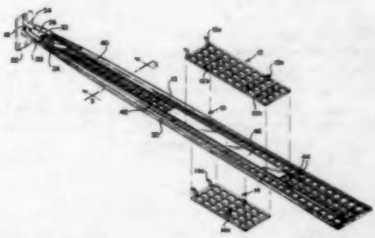
PELTING BOARD

Harold B. Craggs, 7715 Robe Menzel Rd., Granite Falls, Wash. 98252, and Leo Weisdorfer, 113309 SE. 272nd Ave., Boring, Oreg. 97009

Filed Apr. 20, 1981, Ser. No. 255,767

Int. Cl.³ C14B *1/26*

U.S. Cl. 34—103 **15 Claims**



1. A pelting board for drying pelts in a fur out pelting process, capable of tautly holding a pelt about the board, and comprising a generally flat, elongated, generally parabolic, relatively narrow frame, wherein the frame has:

(a) a curved parabolic end;

(b) raised edges adapted to hold the pelt substantially out of contact with the frame except around the edges of the frame; and

(c) at least one open channel on each edge adapted to allow air flow along the edge so that air is capable of directly contacting the pelt to improve pelt drying and to reduce sticking of the pelt along the edge by reducing the area of contact between the pelt and the frame.

4,389,796

HEAT EXCHANGER

Rolf R. Ödman, Malmberget, Sweden, assignor to Luossavaara-Kiirunavaara Aktiebolag, Stockholm, Sweden

Filed Mar. 3, 1981, Ser. No. 239,189

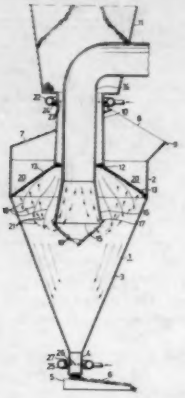
Claims priority, application Sweden, Mar. 5, 1980, 8001749

Int. Cl.³ F26B *17/14*

U.S. Cl. 34—168 **6 Claims**

1. A heat exchanger for heat exchange between downwardly flowing solid particulate material and a gas, comprising a casing having a substantially conical part, and a tubular outlet for material having undergone heat exchange arranged at the

bottom of the conical part; a tube extending downwardly into the casing substantially symmetrically about the vertical axis thereof and forming an outer defining wall of an annular material introducing means, said tube having a material inlet orifice at its upper end and a material discharge orifice at its lower end, the lower end of said tube terminating in the upper portion of said casing; a gas inlet means comprising a gas inlet pipe which extends down into the casing through said tube co-axially therewith and which forms an inner defining wall of said



annular material introducing means, said gas inlet pipe having a discharge orifice located at a given distance beneath the discharge orifice of the material introducing means; and a collecting chamber for gas having undergone heat exchange, said chamber being laterally defined by the wall of said tube and the wall of said casing and being provided with gas outlet means, said given distance being approximately equal to the radial distance between the discharge orifice of the material introducing means and said casing wall.

4,389,797

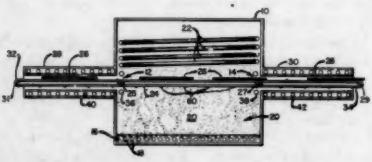
CONTINUOUS VAPOR PROCESSING SYSTEM

Donald J. Spigarelli, Carlisle, and Paul C. Dustin, Reading, both of Mass., assignors to The HTC Corporation, Concord, Mass.

Filed Jun. 23, 1981, Ser. No. 276,493

Int. Cl.³ F26B *21/06*

U.S. Cl. 34—73 **17 Claims**



1. A continuous vapor phase processing system of the type wherein work is selectively heated by a processing vapor in a processing vapor zone to a preselected temperature for vapor phase processing, comprising:

a vessel containing a processing vapor in a processing vapor zone, a first aperture in the vessel side wall within the vapor zone and below the upper level of the processing vapor zone and by which a work product is introduced into the processing vapor, and a second aperture in the confronting vessel side wall within the vapor zone and below the upper level of the processing vapor zone and by which a work product is removed from the processing vapor;

a first conduit in communication with the first aperture and extending outwardly from the vessel side wall and having an outer end open to the atmosphere;

a second conduit in communication with the second aperture and outwardly extending from the confronting vessel side wall and having an outer end open to the atmosphere;

each of said conduits having a cross-section and a length selected to allow passage of a work product therethrough and to provide an intended flow resistance to impede the outward flow of the processing vapor in the conduit and significantly prevent the exit thereof to the atmosphere;

first means associated with each of said apertures for cooling the region of the vessel adjacent the apertures to below the condensation temperature of the processing vapor to prevent significant processing vapor from entering respective conduits;

second means respectively disposed on and extending along at least a portion of the length of said conduits for cooling the processing vapor therein to below the condensation temperature therefor to significantly prevent said processing vapor from exiting the conduits to the atmosphere;

means for conveying a work product through said first conduit into the processing vapor zone of said vessel and out of the vessel through said second conduit; and

said first and second conduits being substantially in alignment on respective sides of the vapor zone of the vessel to provide substantially straight-through conveyance of the work product through the first conduit into the processing zone of the vessel and out of the vessel through the second conduit.

4,389,798

ATHLETIC SHOE

Harvey G. Tilles, P.O. Box 5466, 614 N. Hamilton, High Point, Guilford, N.C. 27262

Filed May 8, 1981, Ser. No. 261,887

Int. Cl.³ A43B *5/00, 13/04*

U.S. Cl. 36—129 **13 Claims**

1. In an athletic shoe comprising an upper portion integral with a sole portion, said upper portion including medial and lateral side portions integral with corresponding medial and lateral side portions of said sole portion, said upper portion including a heel portion and toe portion integral with corresponding portions of said sole portion, and said upper portion including means for securing a user's foot in said shoe, the improvement comprising:

the medial aspect of the sole portion being linear and radiused at least from the ball of the foot toward the heel and beneath and the extent of the plantar arch for permitting the entire medial edge to readily rotate and support the user's foot during maximum pronation over said medial edge.

4,389,799

SCRUB CRUSHER

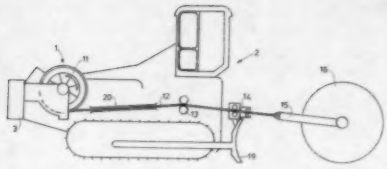
Leo A. Norton, and Christopher W. Norton, both of Waimauku, New Zealand, assignors to Lyndale Holdings Limited, Waimauku, New Zealand

Filed Nov. 9, 1979, Ser. No. 92,938

Claims priority, application New Zealand, Nov. 10, 1978, 188883; Nov. 10, 1978, 188886

Int. Cl.³ A01D 49/00

U.S. Cl. 37—2 R 11 Claims



1. A vehicle dual winch system for operating a single heavy load such as a heavy scrub crushing roller or the like comprising, a winch mounted on each side of a tractor vehicle adjacent one end thereof, each winch having a winch drum, a drive input shaft, a pair of intermediate drive shafts extending in opposite directions perpendicular to the rotational axis of said drive input shaft and operably connected together and to said drive input shaft by a bevel gear mechanism, dual clutches each of which is operably connected to an intermediate drive shaft, dual flexible joints each of which is operably connected to one of said clutches, means to connect said drive input shaft to a power take-off driven by the tractor vehicle, a planetary gear mechanism operably mounted within each winch drum and operably connecting each winch drum to the respective flexible joint, a separate winch cable operably attached to each winch drum and passing along the respective side of said vehicle, a cable guide attached to each side of said vehicle and operably engaging the respective winch cable, said cables being attached to the single roller at spaced points so that said roller can be steered by said winches.

4,389,800

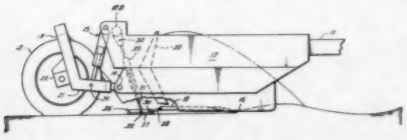
LAND LEVELING SCRAPERS

Larry G. Goby, McAllen, Tex., assignor to Reynolds Manufacturing Company, McAllen, Tex.

Filed Mar. 1, 1982, Ser. No. 351,502

Int. Cl.³ E02F 5/00

U.S. Cl. 37—124 10 Claims



1. In a land leveling scraper, comprising a frame including a front section for connection to a towing vehicle, a rear section pivotally connected to the front section and having wheels with pneumatic tires carried thereon for engagement with the ground surface, a bucket supported by the frame and having a front opening through which soil may pass and a cutting edge across the lower edge of the front opening, and means including an hydraulically operated, cylinder and piston type actuator connecting the frame sections for causing them to swing about their pivotal connection in order to raise or lower the wheels and thus respectively lower or raise the cutting edge of the bucket with respect to the ground surface, and skid shoes each comprising a plate having a substantially flat bottom surface, and mounting on one of the frame sections for sliding over the ground surface during foward movement of the frame; the improvement wherein the forward end of each skid plate is pivotally connected to the one frame section, a leg is pivotally connected at its upper end to said one frame section and at its lower end to the skid plate rearwardly of the forward end thereof, one end of the leg having a cylinder and the other a piston slidable within the cylinder moving the bottom surface of the plate toward or away from the ground surface, and an hydraulic system including a source of hydraulic fluid connected with the cylinders on opposite sides of the pistons thereon.

4,389,801

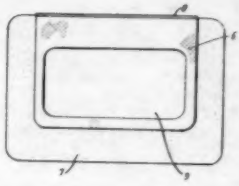
POCKETS FOR GARMENTS

Michael Sharrock, Oxton; Donovan N. Fry, and Robert William, both of Skegness, all of England, assignors to Joel & Aronoff, Inc., Ridgefield, N.J.

Filed Dec. 24, 1981, Ser. No. 334,326

Int. Cl.³ A47G 1/06; G09F 1/10; A44C 3/00; A41D 27/20

U.S. Cl. 40—159 12 Claims



1. A pocket for a garment comprising a facing sheet of flexible material provided with an adhesive backing and having an opening through which a card or the like can be displayed, and a masking sheet of flexible material attached to the facing sheet in order to mask the adhesive backing in the region around and above said opening when the pocket is attached to a garment, whereby the portion of the facing sheet which is around and above the opening in use does not adhere to the garment and enables a card or the like to be inserted into the pocket.

4,389,802

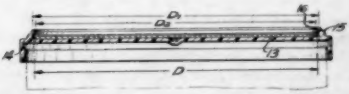
SCALLOPED PAPERBOARD INSERT FOR USE WITH PLASTIC LID

Edwin C. McLaren, Apple Valley, and David J. Adamek, Minneapolis, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Nov. 12, 1981, Ser. No. 320,330

Int. Cl.³ G09F 3/00; F24H 1/10; H05B 1/00

U.S. Cl. 40—307 1 Claim



1. In combination, a plastic lid having an outer upper medial planar surface bounded by a circular upwardly and inwardly extending bead formed on said upper surface, said bead having a free inner edge defining a circle having a diameter D_1, said medial planar surface having a diameter D_2, which diameter D_2 is larger than the diameter D_1 said bead merging into a flat annular peripheral upper surface on said lid, said flat annular peripheral upper surface merging with an annular skirt portion depending downwardly from the periphery of said lid, said skirt portion including an upper and lower portion having a smooth contiguous outer surface and the inner surface of said upper skirt portion being recessed with respect to the inner

surface of the lower portion of said skirt to define a shoulder therebetween and the inner surface of said lower skirt portion being flared outwardly at an acute angle with respect to the vertical; and

a circular paperboard insert disposed on said medial planar surface of said lid, said insert being free of adhesive securement to said medial planar surface of said lid, said insert having an outer edge formed by a succession of contiguous curvilinear nodes and intervening indents, each node consisting of a portion of a circle having a predetermined radius which is smaller than the radius of said circular insert, said insert having a continuous central portion having printed matter disposed on at least one side thereof, the diameter D of said circular insert as defined collectively by the outermost points on said nodes being larger than the diameter D_1, and the diameter of said circular insert as defined collectively by said indents being of a size whereby deformation of said insert caused by expansion of said insert when the latter is disposed on said medial planar surface of said lid resulting from changes in ambient humidity, and caused by moving said insert past said bead is confined to said nodes.

4,389,803

SLIDE VIEWER OR PROJECTOR

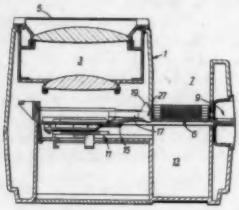
Sidney R. Dunn, Eastbourne, England, assignor to Photax (London) Ltd., Eastbourne, England

Filed Sep. 9, 1981, Ser. No. 300,475

Claims priority, application United Kingdom, Sep. 11, 1980, 8029425

Int. Cl.³ G03B *20/01, 23/04*

U.S. Cl. 40—361 **5 Claims**



1. A slide viewer or projector having a region for receiving a stack of slides and means providing a path extending from said region to a viewing or projecting area, a slide changer for displacing slides one at a time along said path from the region to said than the thickness of the thinnest slide to be accommodated, a wiper pivotally mounted on the barrier and biased to a position in which a portion of the wiper is spaced from the path by a distance not less than the separation of the barrier from the path and is positioned between the barrier and the region, the action of a slide moving from said region to said area causing the wiper to be pivoted against the action of the biasing means until the barrier is raised on to the upper surface of the slide and the wiper then pivots back and wipes over the upper surface of the slide.

4,389,804

MATRIX DISPLAY

Lloyd Seibert, Coeur d'Alene, Id., and George E. Ellefsen, Spokane, Wash., assignors to American Sign & Indicator Corporation, Spokane, Wash.

Filed Dec. 11, 1980, Ser. No. 215,358

Int. Cl.³ G09F *3/04*

U.S. Cl. 40—447 **8 Claims**

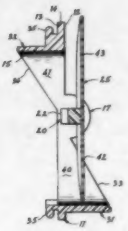
1. A movable display assembly adapted for use in a spatial arrangement that includes a plurality of individually controlled assemblies, said display assembly comprising:

a frame surrounding an open window;

bearing means transversely spanning the window on said frame, said bearing means defining a transverse pivot axis dividing the window asymmetrically into first and second window sections;

a disk assembly pivotally mounted on said frame by said bearing means for movement relative to the frame about the pivot axis, said disk assembly including a thin disk having visually contrasting outer surfaces at opposite sides thereof;

and means on said disk assembly and said frame for selectively positioning said disk assembly about said axis;



said disk having first and second disk ends extending oppositely from the pivot axis, the first and second disk ends having greater widths between the side edges and lengths from the pivot axis to the end edges than the corresponding widths and lengths of the second and first window sections, respectively, for sealing about the disk periphery to prevent light passage when the disk is in a background position;

said first disk end having smaller widths and lengths than the corresponding widths and lengths of the first window section for allowing the disk to freely rotate thereinto.

4,389,805

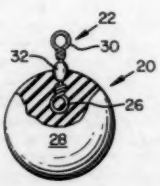
ELASTOMER FORMULATED FISHING PRODUCT

John C. Hargrave, 18010 S.W. Francis, Aloha, Oreg. 97005

Filed Jul. 7, 1980, Ser. No. 166,154

Int. Cl.³ A01K *95/00*

U.S. Cl. 43—43.14 **1 Claim**



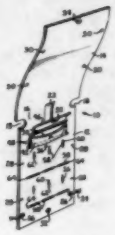
1. A fishing sinker comprising a spherical body of elastomeric material formulated with a gravity change additive dispersed throughout the body providing the sinker with a specific gravity between 1.04 and 4.00 and a swivel axially mounted in and bonded to the body for connecting the sinker to a fishing line.

4,389,806

LURE CASE

Charles H. Herring, 1015 N. Scott, Apt. 8, Belton, Mo. 64012

Filed Feb. 3, 1981, Ser. No. 231,258
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—57.1 **10 Claims**



1. A belt mounted lure case for holding fishing lures and other fishing accessories, said lure case comprising:

a generally flat body portion constructed of a flexible material and having a front surface;

a plurality of swivel elements attached to said front surface of the body portion and each presenting an eye adapted to receive a hook of a fishing lure;

a plurality of flexible springs attached at opposite ends thereof to said front surface below the respective swivel elements, each spring being adapted to receive another hook of said fishing lure between the opposite ends of the spring to cooperate with the swivel element in attaching the lure to the front surface of said body portion;

a pouch on said front surface of said body portion presenting a pocket for holding fishing lures and other fishing accessories;

a generally flat flap integral with said body portion and of sufficient size to substantially cover said front surface of the body portion, said flap being adapted to be passed around the belt of a fisherman and folded downwardly over the belt and over said front surface of the body portion to attach the body portion and flap to the belt with the flap covering the front surface of the body portion;

releasable means for securing said flap to the body portion in covering relation to said front surface; and

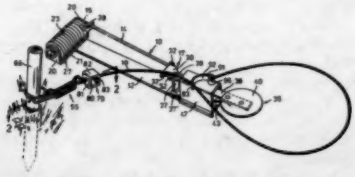
an elongate cord extending from said body portion and adapted to be drawn around the leg of the fisherman and tied in a manner to secure the body portion against the front of the leg.

4,389,807

SHOCK-ABSORBING ANIMAL TRAP

Milan Novak, Aurora, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources, Toronto, Canada

Filed Apr. 7, 1981, Ser. No. 251,876
Claims priority, application Canada, Feb. 6, 1981, 370256
Int. Cl.³ A10M *23/26*
U.S. Cl. 43—96 **4 Claims**



2. In an animal trap having a portion which attaches to an animal when the latter springs the trap, said portion being capable of being affixed with respect to the terrain,

the improvement according to which there is provided a shock-absorbing apparatus through which said portion can be affixed with respect to the terrain, the apparatus comprising:

(a) a resilient member inserted between (1) a connection between said portion and said apparatus and (2) a location where said apparatus is affixed with respect to the terrain, whereby if the trapped animal should lunge away from the trap, the resilient member will extend and absorb at least some of the resulting shock so that injury to the animal is minimized, and

(b) a non-resilient member attached between said connection and said location, said non-resilient member limiting the extension of said resilient member such that the latter does not exceed its elastic limit during extension,

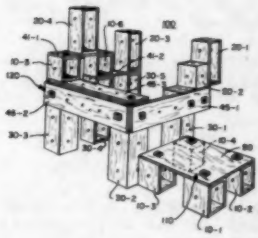
the resilient member being a coil spring, the non-resilient member being an elongated, hairpin-shaped metal clip having a loop at one extremity and two free, adjacent ends at the other extremity, the loop being connected to a ring adapted to engage a stake driven into the ground, said free ends being attached to a coupling member to which the said portion is also connected, the metal clip passing axially through said coil spring, the coil spring being connected at one end to said ring and at the other end to a part of the metal clip adjacent to coupling member.

4,389,808

BOLT-TOGETHER BUILDING SET FOR CHILDREN

Jack Podell, and Douglas Haner, both of San Francisco, Calif., assignors to SB/JP Enterprises, Inc., San Francisco, Calif.

Filed Jun. 1, 1981, Ser. No. 268,694
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—16 **3 Claims**



1. A set of building components for children comprising a multiplicity of hollow blocks having one open face and five closed faces and being formed to different lengths corresponding to integer multiples of the length of the shortest block with the open face of each block being along the longest dimension thereof, each of said blocks having the same cross-sectional configuration transverse to said open face thereof, each of said closed block faces having at least one aperture therein formed along the center line of said face with longer faces on said longer blocks having a plurality of apertures therein spaced from each other by integer multiples of one-half the shortest block length, and a plurality of nut and bolt fasteners with said bolts having a length sufficient to extend through at least a pair of aligned apertures in block faces butted together to enable rigid fastening of said blocks together in a variety of structural combinations and configurations; said shortest block being a regular cube; and said set further comprising a plurality of flat boards of different lengths, each of said boards having a width substantially equal to the length of said cube, a length corresponding to an integer multiple of the length of said cube, and a plurality of apertures formed along a centerline thereof and spaced from each other by an integer multiple of one-half the cube length.

4,389,809

CONNECTING ELEMENT

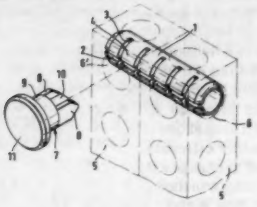
Artur Fischer, Weinhalde 14-18, D-7244 Tumlingen, Waldachtal 3, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 175,196, Jul. 31, 1980. This application Jan. 5, 1981, Ser. No. 222,755

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934094; Sep. 1, 1979, 2935467

Int. Cl.³ A63H *33/10*

U.S. Cl. 46—26 **8 Claims**



1. A pin-shaped connecting element in combination with toy structural elements each having at least two openings which intersect one another and have a predetermined diameter, the connecting element comprising an elongated body part having a portion with a diameter exceeding the diameter of the openings of the structural elements, said portion having at least one longitudinal slot extending over said portion so as to render the latter resiliently yieldable, and a plurality of transverse slots extending transversely to and intersecting said longitudinal slot over a part of the periphery of said portion and subdividing the latter into at least three sections which are thereby resiliently yieldable independently of one another, said transverse slots being arranged so that said portion can be inserted into one of the openings of one of said structural elements, with said transverse slots being located in the region of the other of the openings, which intersect the one opening; means for arresting said portion of said body part in the one opening of the structural element, said arresting means including an arresting member which is arranged to extend through the other intersecting opening of the structural element and having two projections engageable in said transverse slots of said portion, when said arresting member extends through the other intersecting opening of the one structural element and said transverse slots are located in the region of said other intersecting opening; and means for reinforcing said two projections of said arresting member, said reinforcing means including a web which extends between and connects said two projections with one another.

4,389,810

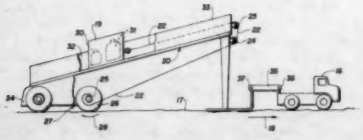
METERING TOY FOR SELECTING A SELF-PROPELLED VEHICLE OF GREATEST STRENGTH

Carmel H. Green, 2169 Carol St., Union City, Tenn. 38261

Filed Apr. 26, 1982, Ser. No. 371,972

Int. Cl.³ A63H *17/05*

U.S. Cl. 46—264 **3 Claims**



1. A toy metering assembly for competitively determining the strengths of self-propelled toy vehicles, comprising in combination,

a set of surface-engaging wheels coupled by an axle for rotation therewith,

a framework mounting said axle for rotation therein,

a sled having a friction mat adapted to slide upon a surface upon which the vehicles are propelled,

a ramp coupled between the framework and sled providing an incline upwardly toward the sled,

a body of predetermined weight movable over a pathway up said ramp,

a cable affixed at respective ends thereof to said body and said axle adapted to wrap around said axle as the wheels are turned thereby to pull the sled up said ramp and increase the weight on said sled and thus the friction between the sled and the surface,

and means for connecting a self-propelled toy vehicle to the sled for pulling the sled assembly and turning the wheels thereby to move the body up the ramp and gradually increase the load on the vehicle as the distance over which the sled is pulled increases.

4,389,811

BIRD ACTION TOY

Hirokatsu Iwaya, Tokyo; Hiroshi Saigo, Kasukabe, and Takashi Suzuki, Tokyo, all of Japan, assignors to Iwaya Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,462

Claims priority, application Japan, Nov. 19, 1980, 55-165661[U]

Int. Cl.³ A63H *33/26, 11/00*

U.S. Cl. 46—232 **11 Claims**

1. An animal action toy comprising:

a hollow perch;

means on said perch for detachably supporting said perch on another object;

a battery receptacle in said hollow perch for receiving a battery therein;

an electric switch on said perch for connecting and disconnecting a battery in said receptacle;

model support means on and extending upwardly from said perch;

a model animal including a main hollow body portion and at least one subsidiary body portion relatively movable with respect to said main hollow body portion, said main hollow body portion including an aperture through which said model support means extends;

an operating mechanism located within said main hollow body portion of said model animal and mechanically connected to said model support means on said perch, to said main hollow body portion and to said subsidiary body portion;

and an electric motor located within said main hollow body portion of said model animal, said motor being mechanically connected to drive said operating mechanism and

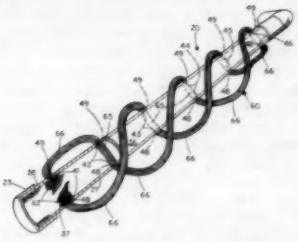
operable when electrically energized to effect relative motion between said main hollow body portion and said perch and between said subsidiary body portion and said main hollow body portion, said motor being electrically connectable to and disconnectable from said battery receptacle by means of said electric switch.

4,389,812

HERBICIDE WAND AND METHOD FOR MAKING

Swen A. Panttaja, 6446 S. Reed, Reedley, Calif. 93654

Filed Aug. 24, 1981, Ser. No. 295,697
Int. Cl.³ A01M *21/00*
U.S. Cl. 47—1.5 **2 Claims**



1. In a wand for applying systemic herbicide having a tubular handle and an elongated tubular distributor head extended from the handle, the handle and distributor head having interconnected reservoirs for herbicide and a releasably closable filler opening, the distributor head having an even number of pairs of diametrically aligned bores therethrough of predetermined diameter disposed in a common plane, the head having a predetermined upper side and a lower side and each pair of bores having a forward bore and a rearward bore and each pair being consecutively numbered from one end of the head; and a single length of braided cord having a diameter greater than that of the bores when untensioned and a diameter smaller than said bores when tensioned, the cord having a knotted end within the reservoir, extended successively outwardly through a first rearward bore, outwardly along the rearward side of the head to the second rearward bore, inwardly through the second rearward bore, outwardly through the second forward bore, successively downwardly about the head beneath each odd numbered pair of aligned bores and successively through the aligned highest even numbered bores from the rearward to the forward thereof, and from the highest even numbered bores along the forward side of the head to the highest odd numbered pair of bores and therethrough from the forward bore through the rearward bore and thence successively downwardly about the head beneath each even numbered pair of aligned bores and successively through the aligned odd numbered bores from the forward to the rearward thereof and being knotted within the reservoir inwardly of the first forward bore, the cord being directly engaged with the walls of the bores in substantially fluid-tight engagement therewith when untensioned and being slidably adjustably movable therethrough when tensioned.

4,389,813

PLANTER TREE FOR FLOOR, WALL OR CEILING MOUNTING

Michael J. Jaques, and Diane H. Jaques, both of 685 E. Monterey, Chandler, Ariz. 85224

Filed Jan. 26, 1981, Ser. No. 228,469
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—67 **2 Claims**

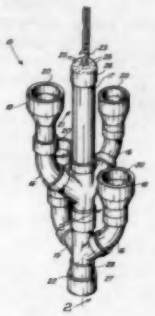
1. A planter comprising:

at least a pair of parts fitted together to form a hollow tree configuration having a trunk comprising a top and bottom, branches extending laterally therefrom and a base at the bottom of said trunk,

each of said branches being open at its top for receiving therein and along at least a part of said trunk growing material for physically and nutritionally supporting root growth of plants growing in the tip of said branches, along said branches and in said trunk,

the base of said trunk forming a drainage opening for any excess liquid moving from the branches of the tree and through its trunk to said base,

support means connected to one of the ends of said trunk for supporting said trunk of the tree configuration in a substantially vertical position,



a light fixture mounted on the top of said trunk,

said light fixture comprising a reflector for reflecting light generated by said fixture onto any plants contained in the planter,

a liquid impervious tube extending between said light fixture and said base of the planter axially of said trunk,

an electric cord connected to said light fixture and extending through said tube outwardly of said base for connecting to a source of electric power, and

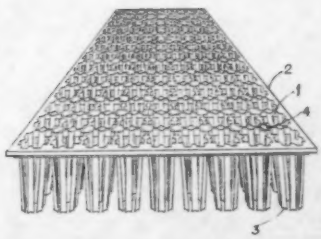
a hook mounted on the top of said reflector for use in supporting the planter from a wall or ceiling structure.

4,389,814

SEEDLING TRANSPLANT UNIT

Gustav O. Andreason; Ulf R. Friberg, both of Falun; Heimo H. Kuvaja, Borlänge, and Bengt G. L. Qvarnström, Smygehamn, all of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Feb. 4, 1981, Ser. No. 231,328
Claims priority, application Sweden, Feb. 15, 1980, 8001210
Int. Cl.³ A01G *9/10*
U.S. Cl. 47—73 **21 Claims**



1. A seedling unit using a growth medium for elevated growing of seedlings and for repeated use, comprising a plurality of seedling pots disposed adjacent to and joined to each other at the region of their openings, each pot including: an upper

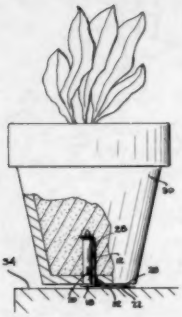
frame forming a top part of the seedling unit, a plurality of spaced strips extending from each said opening in a convergent manner to form each said pot substantially to look like a downwardly converging cage, the spaced strips being free and substantially devoid of bends at their loose ends and defining an open bottom of the pot and being dimensioned to retain the weight of a desired amount of growth medium in each pot, said convergent strips being directly in contact with growth medium in use and being resilient enough to spring back to their original shape when opened in use to be substantially parallel to each other temporarily to release the growth medium along with a seedling for transplantation.

4,389,815

WICK SUPPORT FOR WICK-WATERING PLANTS

Roy L. English, and Irene F. English, both of 1520 Anna Way, #58, Oxnard, Calif. 93030

Filed Nov. 6, 1981, Ser. No. 318,837
Int. Cl.³ A01G *9/00*
U.S. Cl. 47—81 **3 Claims**



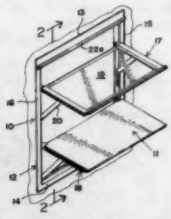
1. A wick support comprising an elongated rigid section having one end which includes means for holding a wick at a first location along the length of the wick, a handle section affixed to the other end of the rigid section and extending outward therefrom; and a flexible section projecting from the handle section in a direction opposite to that of the rigid section and terminating in a free end which includes a means for holding the wick at a second location along the length of the wick.

4,389,816

SHEET METAL PROTECTIVE COVER FOR AWNING WINDOWS

Ward W. Chapman, 2700 W. 3rd Ct., Hialeah, Fla. 33010

Filed Mar. 24, 1981, Ser. No. 247,221
Int. Cl.³ E05B *65/04*
U.S. Cl. 49—62 **2 Claims**



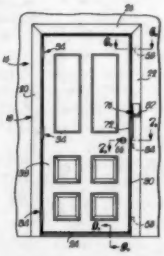
1. A protective cover for the window sashes of awning windows of the type having rectangular sashes mechanically linked with respect to a window frame for movement between open and closed positions and in the closed position of which upper portions of a sash framework locks behind the lower marginal portion of the next higher window sash or, if the top sash, behind a lower marginal portion of the awning window frame header, the combination comprising; a substantially rectangular sheet metal cover member, the lower marginal edge portion of said cover member being reversely bent to provide a shallow, upwardly-directed slot at one side of said cover member, said cover member having a substantially right-angular, upper marginal portion bent in the direction of said one side thereof, the spacing between the bottom of said slot and the under-side of said substantially right-angular upper marginal portion being such that when the protective cover is fitted to an awning window sash by placing the lower marginal edge portion of the sash in said slot, said substantially right-angular bent portion fits in frictional abutment over the top edge of the window sash framework, said substantially right-angular, upper marginal portion of said cover member forming an angle of slightly less than 90 circular degrees with respect to said one side of said cover member, said cover member being integrally formed by bending of somewhat resilient sheet metal to provide for interhooking engagement of said upper marginal portion over the top edge of a window sash framework.

4,389,817

DOUBLE DOOR ASSEMBLY

Leonard E. Olberding, 12960 Quivira, Overland Park, Kans. 66213

Filed Jun. 1, 1981, Ser. No. 268,714
Int. Cl.³ E05D *15/48;* **E05B** *65/04*
U.S. Cl. 49—163 **5 Claims**



1. A safety door assembly for reducing the risk of injury or loss resulting from robbery, burglary or unauthorized entry, said assembly including:

an open, upright framework having a pair of horizontally spaced stiles, a threshold between the stiles and an upper header between the stiles;

an upright, inwardly-opening outer door complementally fitted within, entirely surrounded by said framework and provided with a continuous, inwardly-extending, peripheral band complementally fitted within and entirely surrounded by said framework, presenting an inwardly-facing cavity extending throughout its width and height;

a number of vertically spaced hinges attached to one of said stiles and to the proximal vertical stretch of said band,

said hinges supporting the outer door for horizontal swinging movement into and out of said framework;

an upright, inwardly-opening inner door complementally nested within said cavity, entirely surrounded by said band and operably connected with said hinges along one vertical edge of the inner door,

said hinges supporting the inner door for horizontal swinging movement relative to the outer door into and out of said cavity,

said hinges having vertically aligned hinge pins common to said door and disposed adjacent the inner face of the inner

door for horizontal swinging of the doors as a unit about the axes of said pins; and

a solenoid within the other of said stiles having a core reciprocable horizontally toward and away from the outer door when the latter is within said framework,

said band being provided with a core-receiving aperture.

4,389,818

POWER OPERATED AUTOMOBILE WINDOW GLASS REGULATING MECHANISM

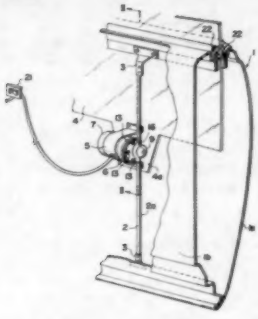
Toshinori Sakamoto, Hiroshima, Japan, assignor to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Filed Sep. 28, 1981, Ser. No. 306,394

Claims priority, application Japan, Sep. 29, 1980, 55-139630[U]

Int. Cl.³ E05F *15/16*

U.S. Cl. 49—349 **9 Claims**



1. A power operated automobile window regulating mechanism for driving a window glass panel between a closed and open positions in an automobile body panel, said regulating mechanism comprising flexible strap means secured to said body panel to extend along a direction of movement of the window glass panel, motor means carried on said window glass panel and having output means, said strap means having means engageable with said output means, guide means for forcing said strap means toward said output means so that the output means is drivingly engaged with the strap means.

4,389,819

GLASS POLISHING PROCESSES

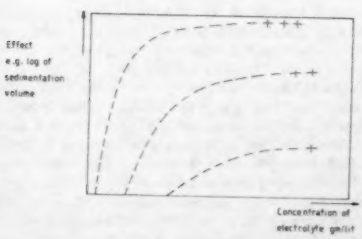
John P. H. Williamson, Chester, and John L. Moilliet, Abberley, both of England, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 25, 1980, Ser. No. 210,261

Claims priority, application United Kingdom, Nov. 29, 1979, 7941296

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—317 **11 Claims**



1. A method of polishing mineral and organic material in which the polishing compound comprises a material selected from the group consisting of rare earth metal compounds and zirconium oxide, which material is in powder form mixed with water and is maintained in a state of reversible flocculation by means of mixing the material with (a) an alkali metal or an ammonium salt of the condensation product of naphthalene sulfonic acid with formaldehyde or lignin sulfonic acid serving as an anionic deflocculating agent in an amount necessary to cause deflocculation, and (b) an electrolyte containing a metal cation having a valency greater than 1.

4,389,820

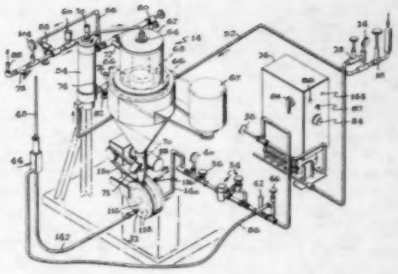
BLASTING MACHINE UTILIZING SUBLIMABLE PARTICLES

Calvin C. Fong, Beverly Hills; John W. Altizer, Simi Valley; Vernon E. Arnold, Fillmore, and John K. Lawson, Granada Hills, all of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 29, 1980, Ser. No. 220,372

Int. Cl.³ B24C *3/00, 1/00*

U.S. Cl. 51—410 **22 Claims**



1. A blasting machine utilizing particles of materials capable of sublimation comprising:

forming means for producing said particles, said forming means including means for causing said particles to have a substantially uniform length thereto;

dispensing means coupled to said forming means and adapted to receive said particles from said forming means and to introduce said particles into a low pressure transport gas flow;

nozzle means for accelerating said particles and having a high pressure, low velocity gas flow coupled thereto, said nozzle means being adapted to convert said high pressure, low velocity gas flow into a low pressure, high velocity gas flow; and

conduit means coupled to said nozzle means and said dispensing means for receiving said particles and said low pressure transport gas flow and for enabling said low pressure transport gas flow to transport said particles to said nozzle and to deliver said particles into said low pressure, high velocity gas flow within said nozzle;

whereby said particles are entrained in said high velocity gas flow and are accelerated thereby.

4,389,821

INFLATABLE DOCK SEAL

Larry O'Neal, 549 W. Indianola Ave., Youngstown, Ohio 44502

Filed Jul. 13, 1981, Ser. No. 282,926

Int. Cl.³ E06B *7/22*

U.S. Cl. 52—2 **3 Claims**

1. An inflatable dock seal for positioning on a building having an opening defined therein and comprising an inflatable inverted U-shaped device formed of flexible air impervious material and consisting of a horizontal inflatable member and a

pair of vertical inflatable members in communication therewith, means for attaching said members to said building and means for inflating said members, means for supporting portions of the horizontal member when moved toward and away from the building by inflation and deflation, said means comprising spaced inverted U-shaped support members secured transversely to said horizontal member and pivotally secured to said building therebelow and means for retracting said horizontal member when deflated, said means for retracting said

horizontal member when deflated comprising a retractable flap on said horizontal member, a spring driven roller on said building, said flap attached to said spring driven roller so that the same can be wound up thereon, said horizontal member having portions extending outwardly from said building and downwardly when inflated, said vertical inflatable members each consisting of an elongated hollow flexible member having a transversely arcuate configuration and secured at their opposite outer longitudinal edges to said building adjacent to said opening.

4,389,822

HEAD FOR PASSAGES, DOOR AND WINDOW OPENINGS

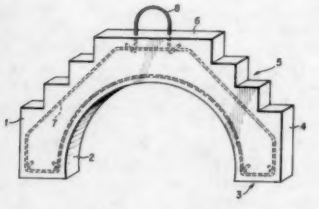
Mathilde Krippner, Sonnenbichl 21, 8952 Marktoberdorf, Fed. Rep. of Germany

Continuation of Ser. No. 916,579, Jun. 19, 1978, abandoned. This application Jul. 30, 1981, Ser. No. 288,352

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1977, 2727625

Int. Cl.³ E06B 1/04

U.S. Cl. 52—125.4 **6 Claims**



1. A head for passages and door or window openings in brickwork, said head being formed from a prefabricated one-piece beam having two supporting surfaces on opposite sides of a passage, a bottom side between said supporting surfaces, said bottom side being elevated in respect to said supporting surfaces, said head being constructed of light-weight concrete or gas concrete and having a configuration wherein said bottom side of the beam has the shape of an arch and is substantially semi-circular with a center of curvature not substantially below a line connecting said supporting surfaces thus producing substantially little or no tensile load during use, said beam further having a top side which is rectangularly stepped, and a steel reinforcement being incorporated into said beam along its length and conforming to its contour, said reinforcement being canted in the step area, where by said steel provides tensile strength for shipping and handling, but in use suplements the compressive strength of said gas concrete.

4,389,823

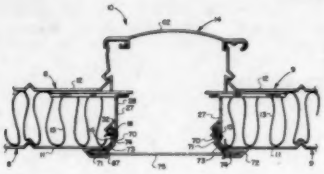
MODULAR ROOF SKYLIGHT

Wayne H. Player, Mesquite, Tex., assignor to Howmet Aluminum Corporation, New York, N.Y.

Filed Jun. 28, 1981, Ser. No. 275,640

Int. Cl.³ E04B 7/18

U.S. Cl. 52—200 **10 Claims**



1. A modular roofing structure and skylight assembly comprising:

channel shaped roofing panels having upstanding side legs with interlockable flanges formed at their upper ends for interlocking a series of panels together in side by side relationships;

channel shaped ceiling panels having upstanding side legs, with interlockable flanges formed at their upper ends for interlocking a series of panels together in side by side relationships;

means suspending said ceiling panels a selected distance beneath said roofing panels;

a skylight roofing panel disposed between said channel shaped roofing panels said skylight panel being formed of light transmitting material and having locking means formed along the longitudinal edges thereof for engagement with the interlocking flanges on the legs of said roofing members;

a pair of elongated skylight ceiling panel mounting strips each engaging opposite edge regions and side walls of adjacent ceiling panels and being secured thereto, said mounting strips each having first and second flanges aligned one to the other in generally orthogonal relationship;

a substantially planar skylight ceiling panel formed out of light transmitting material disposed beneath and in abutting engagement with said ceiling panel mounting strips; and

a pair of elongated ceiling panel mounting clips matingly engaging the outer edges of said skylight ceiling panel and oppositely disposed flange portions of said mounting strips.

4,389,824

WINDOW AND DOOR TRIM FOR USE WITH SIDING

Carl Anderson, 2571 Richmond Terr., Staten Island, N.Y. 10303

Filed Mar. 3, 1980, Ser. No. 126,953

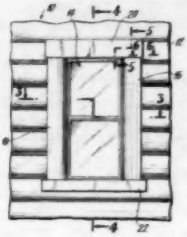
Int. Cl.³ E06B 1/04

U.S. Cl. 52—211 **18 Claims**

1. A window and door trim for use with siding, comprising:

elongated, L-shaped panels having one longer and one short leg interconnected by an angle less than 90°, for fitting around a casing having a front and an inside face, coupling means associated with said shorter leg for coupling of the shorter leg onto the inside face of the casing, said longer leg terminating in a free distal end having an inwardly turned, double folded over panel hem tightly retained against said longer leg to form a triple thickness of material at the distal end, the combination of the less than 90°

interconnection with the double folded over hem providing for spring held abutment of the longer leg against the siding without the use of any fastening members, and wherein the shorter leg is disposable on the inside face of the casing and the longer leg is disposable in a substantially vertical plane on the front face of the casing and entirely overlying the siding without any portion of the



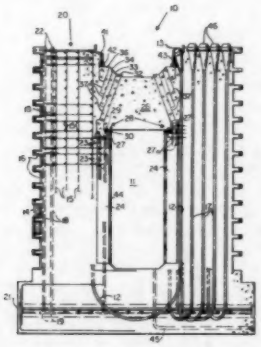
panel lying under the siding, wherein the casing has sections including a side casing and upper casing, and wherein two of said panels form side panels for fitting onto the side casing, the longer legs of said side panels extending across the upper casing and onto the siding, and wherein one of said panels forms an upper panel for fitting onto the upper casing and overlapping said side panels.

4,389,825

PRESTRESSED CONCRETE PRESSURE VESSELS WITH INCREASED PRESSURE-RETAINING CAPABILITY

Philip Y. Chow, Orinda, Calif., assignor to T. Y. Lin International, San Francisco, Calif.

Filed Aug. 28, 1980, Ser. No. 182,015
Int. Cl.³ E04C 3/10
U.S. Cl. 52—224 **4 Claims**



1. A very high pressure prestressed concrete pressure vessel, comprising:

a concrete structure having an outer encompassing surface and a body, with the body being shaped to provide internal cavity means for holding fluid under pressure and conduits providing ingress and egress for the cavity means,

series of circumferential annular horizontal tendons at the outer surface of the body for circumferential post-tensioning of the body;

series of generally vertical tendons in the body, including tendons positioned around the cavity means;

accompanying post-tensioning means for each tendon; and

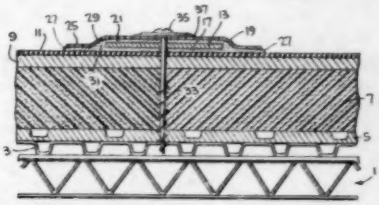
stress relieving means in inner portions of the body adjacent to surfaces of the cavity means, comprising a series of angularly spaced preformed partings oriented generally vertically and extending radially outwardly into the vessel wall from the surfaces of the internal cavity means, for relieving compressive stresses at the internal cavity surfaces and for locating peak compressive stresses due to external circumferential post-tensioning inside the concrete wall so that external post-tensioning can be of very high magnitude without causing stresses to exceed practical limits, and including elastomeric sealing members at the surfaces of the internal cavity means, over the preformed partings, for keeping internal cavity pressure out of the partings, with precompressing means compressing the sealing members toward the partings.

4,389,826

PLATE BONDED SYSTEM ON TOP OF RUBBER AND METHOD OF PREPARING SAME

Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710

Filed Sep. 2, 1980, Ser. No. 183,343
Int. Cl.³ E04B 5/00
U.S. Cl. 52—410 **12 Claims**



1. A roofing installation including, in combination, a deck for supporting the roofing installation, insulation supported by the deck, a flexible membrane supported by the insulation, and a spot bonding pad compatible with adhesive and mounted on and adhesively secured to said flexible membrane, a flexible cover extending over said spot bonding pad and extending beyond the periphery thereof, the flexible cover being adhesively secured to said spot bonding pad and those portions of the cover which extend beyond the periphery of the spot bonding pad being adhesively secured to the flexible membrane, and a fastening means extending through said cover, the spot bonding pad, the flexible membrane, the insulation and the deck.

4,389,827

THROUGH-THE-WALL AIR CONDITIONER COVER KIT

Constance M. Van Valkenburg, 494 Curfew St., St. Paul, Minn. 55104

Filed Jun. 9, 1980, Ser. No. 157,800
Int. Cl.³ E06B 7/00, 9/00
U.S. Cl. 52—511 **2 Claims**

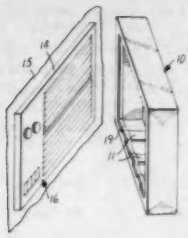
1. A kit for covering an air conditioner unit mounted in a wall of a building, when said unit is not in operation, to reduce heat loss through and around said unit, said kit comprising:

(a) a rigid cover piece formed of a foamed polymeric material which is substantially impermeable to air and thermally nonconductive, having a base wall and four upstanding side walls defining an open-ended chamber having a volume greater than the volume of the portion of the air conditioner unit to be covered: and

(b) an attachment means adapted for securing said cover piece in sealing engagement with said building wall or the housing of said unit comprising:

(1) a backing means which is a flexible polymeric foam selected from a group consisting of polyurethane, polyvinyl chloride and polyethylene, said backing means having a thickness between 0.3 and 2.5 cm.,

(2) a layer of pressure sensitive adhesive on one side of said backing means to attach said backing means to a portion of said cover piece, and



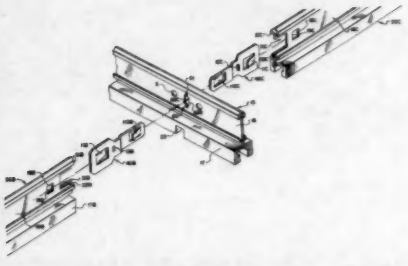
(3) a securing means provided by said backing means itself which is applied to the inner surface of at least one of said side walls of said cover piece whereby said sealing engagement of said cover piece with said housing is provided by friction-fit.

4,389,828

SUSPENDED CEILING SYSTEM WITH CROSSING CLIP

Lloyd H. Cary, Magnolia, Ark., assignor to Howmet Aluminum Corp., New York, N.Y.

Filed Jun. 12, 1980, Ser. No. 158,797
Int. Cl.³ E04C 2/42
U.S. Cl. 52—665 **9 Claims**



8. In a suspended ceiling system used for supporting ceiling tiles and other fixtures within a grid framework suspended beneath the major structural elements in a building, the connecting apparatus comprising:

a plurality of rails having a vertical web and a flange beneath said web, said plurality of rails including first and second abutting rails and an abutted rail, said first and second abutting rails each being connectable at one end to opposing sides of said abutted rail of the grid framework, both said first and second abutting rails being connectable coaxially to each other and at an angle to the abutted rail;

said first and second abutting rails each having a pair of vertically disposed axial grooves defined by channels connected to said web and positioned separate from said flange on said abutting rail;

a slit through the web of said abutted rail;

a duality of clips, each clip having a first end having a first spring biased detent finger receivable through said slit for attachment to said abutted rail, and a second end having a substantially planar face bounded on opposite sides by parallel edges slidably receivable into said grooves of said abutting rail, and a second spring biased detent finger on said second end, said second detent finger extending from the face of said clip such that it is biased toward the web of said abutting rail when the clip is registered into said grooves for assembly;

a first retaining surface presented for each said first detent finger, said first retaining surface engagable with said second detent finger;

a second retaining surface presented for each said second detent finger, said second retaining surface located on each said abutting rail web and adapted to engage said second detent finger to secure the clip against longitudinally sliding out of reception within said grooves;

a horizontal offset in each of said clips whereby, upon assembly, said first end of each clip is brought into alignment immediately adjacent that plane which longitudinally bisects the webs of both said coaxially aligned abutting rails;

said slit being vertically oriented and of sufficient breadth to allow two clips to pass through, whereby, both said clips are received through said slit from opposite directions and there pass each other in contact at that plane which bisects the web of both said abutting rails; and

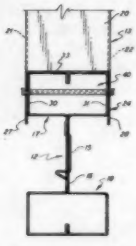
a recess in the end of each abutting rail which, upon assembly, receives the extension of the opposite clip in a manner resistant to a bending moment supplied in the vertical plane between the pair of abutting rails; whereby, upon assembly, each clip cooperates with the other in order to secure a pair of abutting rails in coaxial alignment about a mutally abutted rail.

4,389,829

METAL ROOF SYSTEM

Wesley T. Murphy, 94 Prospect St., Auburn, N.Y. 13021

Filed Dec. 22, 1980, Ser. No. 219,262
Int. Cl.³ E04C 3/02
U.S. Cl. 52—693 **3 Claims**



1. A metal roof support structure that includes

a metal rafter member and a generally opposed metal purlin member each member having a central web and a pair of mounting flanges secured to each end of the web that contain a series of spaced apart elongated holes passing through the flanges thereof,

at least one metal truss for connecting the rafter and the purlin, said truss being formed of a channel shaped member having a base and two opposing side walls, the side wall of the channel having a transverse cut form therein at a predetermined distance from each end of the truss, each cut passing inwardly from the outer edge of the side wall to the base to allow the end sections of the truss to be bent about the base, the inside width between the side walls of the truss being equal to or slightly greater than the outside width of the purlin and rafter flanges so that the end sections of the truss are slidably received over the flanges and can be bent into conformity therewith,

the side walls of the end sections of said truss member having at least one elongated hole formed therein that compliments the holes formed in the side walls of said flanges whereby said holes are brought into alignment in assembly, and

a resilient V-shaped truss pin mounted in the aligned holes that is biased into contact against the truss and the mounting flanges to secure the members in assembly.

4,389,830

ANCHORAGE WITH ACCESSORIES FOR ATTACHMENT TO WALLS, FLOORS AND CEILINGS

Bjorn Ingeberg, Skigardveien 6, Oslo 6, Norway

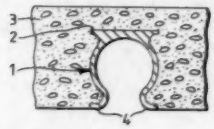
PCT No. PCT/NO80/00017, § 371 Date Jan. 16, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02579, PCT Pub. Date Nov. 27, 1980

PCT Filed May 14, 1980, Ser. No. 230,950

Claims priority, application Norway, May 16, 1979, 791632

Int. Cl.³ E04B *1/40*

U.S. Cl. 52—710 **7 Claims**



1. An anchorage for attachment of ties to walls, floors, ceilings or the like, the anchorage comprising; a substantially circular tubular section having a longitudinally extending slot for the introduction of one end of the tie, the section having external attachment flanges extending tangentially with respect to the section on the side thereof opposite from the slot, and said flanges also extending longitudinally along the section, the flanges thus forming an external abutment surface on the tubular section and said section being made of extruded aluminum.

4,389,831

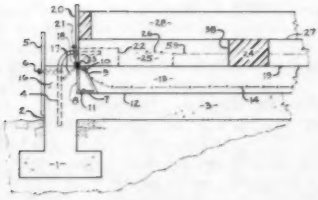
SIMPLIFIED CONSTRUCTION SYSTEM

Hanns U. Baumann, Laguna Beach, Calif., assignor to Sharon K. Baumann Trust, Laguna Beach, Calif.

Filed May 26, 1981, Ser. No. 266,834

Int. Cl.³ E04G *21/00*

U.S. Cl. 52—741 **13 Claims**



1. A method of constructing a reinforced concrete building of the tilt-up type comprising the steps of:

a. pouring a concrete slab foundation, including peripheral footings,

b. positioning an exterior form for the outer wall extending upwardly at least one wall thickness above the upper surface of said foundation,

c. positioning an interior form on the upper surface of said foundation so that the vertical side of said form faces away from the center of said foundation and aligns with the desired inner surface of the outer wall, said form having an upper dimension less than its lower dimension,

d. applying a bond-breaking layer to the upper surface of said foundation,

e. pouring a ceiling slab over said bond-breaking layer including corner lift inserts and reinforcement just above said bond-breaking layer,

f. pouring a stub wall between said interior form and said exterior form including a member for hinging about the upper inner corner of said stub wall,

g. applying a bond-breaking layer to the upper surface of said ceiling slab,

h. positioning an inwardly-facing vertical form above said stub wall,

i. pouring a tiltable sidewall slab over said bond-breaking layer including a mating portion for said hinging member,

j. erecting said tiltable sidewall while pivoting about said mating hinging members,

k. erecting an adjacent tiltable sidewall to form a corner area,

l. interconnecting said adjacent sidewalls in said corner area,

m. positioning elevating means across adjacent sidewalls above said corner areas,

n. elevating said ceiling slab by attaching said elevating means to said ceiling slab at said corner lift inserts,

o. adding form means between the bottom of said elevated ceiling slab and the inner surface of said sidewall,

p. filling in the area above said added form means to connect the edge of said ceiling slab with said sidewall.

4,389,832

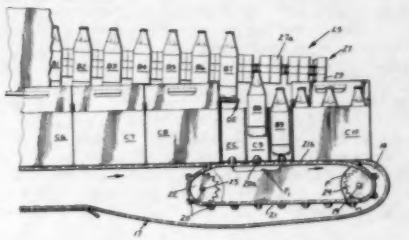
METHOD AND APPARATUS FOR LOADING BOTTLES INTO OPEN TOP BOTTLE CARRIERS

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 16, 1981, Ser. No. 244,163

Int. Cl.³ B65B *21/04, 21/16*

U.S. Cl. 53—48 **5 Claims**



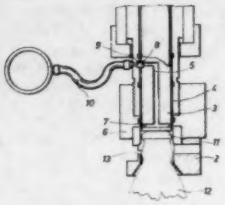
1. A bottle carrier loading machine comprising conveyor means having upper and lower reaches for continuously supplying to a loading station a series of set-up multiple cell bottle carriers arranged in abutting contact, the bottom of each cell having an aperture formed therein, a fixed dead plate disposed above the path of movement of said carriers and having its outfeed end at said loading station, pusher means including a series of generally wedge shaped pusher elements mounted on endless means disposed above said dead plate and arranged to supply to said loading station a continuous series of bottles slidable on said dead plate and in generally upright side-by-side relation, each pusher element being arranged to engage and to push a preceding bottle toward the outfeed end of said dead plate and to engage and guide a succeeding bottle downwardly as it drops off of the outfeed end of said dead plate, a plurality of movable positioning pins arranged respectively to enter corresponding apertures in the bottoms of the carrier cells so as to move the carriers through the loading station in such manner that the carriers receive bottles as they slide off of the outfeed end of said dead plate, said positioning pins being mounted on endless means the upper reach of which at the location where the bottles contact the pins is unsupported throughout its entire width and somewhat yieldable intermediate its ends so that downward movement of the bottles is arrested by a cushioned stop due to engagement of the bottles with the positioning pins at the unsupported portion of the conveyor intermediate the ends of the upper reach of said endless means.

4,389,833

BOTTLE CLOSING MACHINE HAVING BOTTLE NECK WASHING ARRANGEMENT

Uwe Knabe, Holzwickede, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,296
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948633
Int. Cl.³ B65B 7/28, 61/00; B67B 3/12
U.S. Cl. 53—167 9 Claims



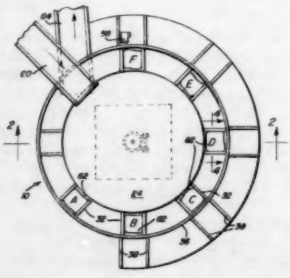
1. An arrangement for closing containers with crown corks and the like, comprising a substantially vertically displaceable cork-displacing piston; guiding means including an inner wall which bounds a guiding opening for displacing said piston therein, said inner wall in the region above and adjacent the cork being spaced from said piston so as to form a gap therebetween; and means for supplying a cleaning liquid and communicating with said gap at a location above the cork in response to displacement of said piston by the cork covering or closing a container, so that said gap is cleaned first above the cork and then the cork is cleaned in condition of a closed container.

4,389,834

LOOSE PRODUCT BAGGING AND BALING SYSTEM

Gregory E. Wysocki, Rte. 1, Custer, Wis. 54423

Filed Mar. 18, 1981, Ser. No. 245,210
Int. Cl.³ B65B 5/10, 39/14
U.S. Cl. 53—475 8 Claims



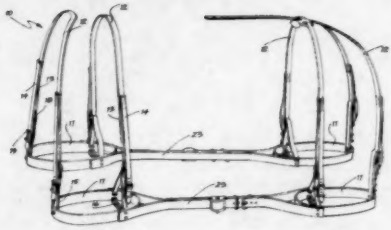
1. A loose product bagging and baling machine including a rotary horizontal table, item delivery means for discharging items on said table, a plurality of stationary worker positions spaced slightly outwardly of and about the periphery of said table, rotary container support means spaced apart in a generally circular path substantially concentric with the axis of rotation of said table and supported for simultaneous angular displacement thereabout with said support means substantially registered with the outer periphery of said table, whereby persons positioned at said worker positions may manually transfer items from said table and place the items being transferred into containers supported from said support means, and first drive means operatively connected to said table for rotating the latter and second drive means operably connected to said container support means for angularly displacing the latter.

4,389,835

SAFETY HOPPLES

Tony Kavalieros, 14 East Street, Marrickville, New South Wales, 2204, Australia

Filed Aug. 3, 1981, Ser. No. 289,528
Claims priority, application Australia, Aug. 7, 1980, PE4919
Int. Cl.³ B68B 1/00; A01K 15/00
U.S. Cl. 54—71 5 Claims



1. A hopple for a horse, comprising four ovate hopple members each of which is adapted to surround one leg of a horse and is provided at or adjacent each end with a riser strap having first connector means to connect the hopple member to supporting strap means adapted to be positioned about the horse and to support the associated hopple member in a substantially horizontal plane about one of the animal's legs, the hopple being characterized in that at least the front one of the riser straps of each of the front hopple members and the rear one of the riser straps of each of the rear hopple members is provided with a second and independent connector means below said first connector means, the corresponding supporting strap means being longitudinally bifurcated, one of the bifurcated portions of each of the said strap means being connected to each of the first connector means of the corresponding riser strap, the other of the bifurcated portions of each of the said strap means being connected to each of the second connector means of the corresponding riser strap said strap means and the corresponding riser straps being such that in the event that the connection between one of the first connector means and a corresponding one of the bifurcated portions of the strap means is broken the corresponding hopple member will be retained in a substantially horizontal plane by the other of the bifurcated portions of that strap means.

4,389,836

CARRIAGE FOR A GRASS TRIMMING DEVICE

Joseph M. Lowry, 308 Sweetbriar Dr., and Ernest E. Griffin, 12306 Ridgefield Pkwy., both of Richmond, Va. 23233

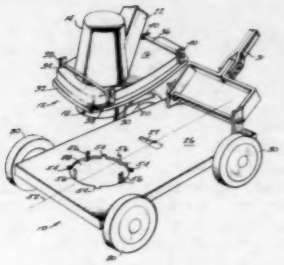
Filed Jul. 8, 1981, Ser. No. 281,421
Int. Cl.³ A01G 3/06
U.S. Cl. 56—12.7 14 Claims

1. A carriage for a trimming device of the type having a motor, a housing for the motor, a cutting element in the form of a length of cable connected to said motor so as to be rotatable about an axis at a relatively high rate of speed for cutting grass, weeds or the like, said carriage comprising:

a platform having a top and bottom side, means for supporting said platform for movement over the ground, and defining a first aperture for receiving the rotatable length of cable so that cable extends below and is rotatable beneath said platform bottom side;

a flange member having a top and bottom side, means for clamping said flange member to said trimming device so

that said top side of said flange member is in a juxtaposed relationship with the bottom side of said trimming device, said clamping means comprising at least one bar member extending across the upper portion of said trimming device and support post members fixedly attaching to said flange member top side for removably receiving said at



least one bar member, said flange member defining a second aperture in coaxial alignment with said first aperture for receiving said rotatable length of cable therethrough; and

cooperating means located on said flange member and on said platform first aperture for removably coupling and securely holding said flange member to said platform.

4,389,837

PLY YARN SPINNING ASSEMBLY

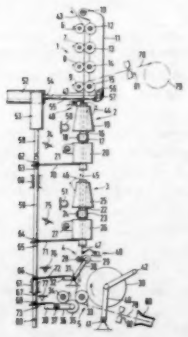
Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, Fed. Rep. of Germany, and Hans Braxmeier, Suessen, Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, of DEX

Filed Jun. 10, 1981, Ser. No. 272,261

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022149

Int. Cl.³ D01H *13/22, 13/16*

U.S. Cl. 57—16 **29 Claims**



1. Ply yarn spinning assembly comprising:

a drawing unit for drawing sliver,

at least one hollow spindle arranged downstream of the drawing unit,

a binding thread bobbin provided respectively at each of said at least one hollow spindles and having a supply of binding thread thereon for binding the sliver passing through the at least one hollow spindle,

drawing unit and hollow spindle driving means,

thread monitoring means for monitoring the yarn condition at at least one position downstream of the drawing unit,

and an operating mechanism for swinging open a load-bearing member of the drawing unit to interrupt the drawing unit driving means in automatic response to detection of a malfunction by said thread monitoring means.

4,389,838

SINGLE-TWIST STRANDING

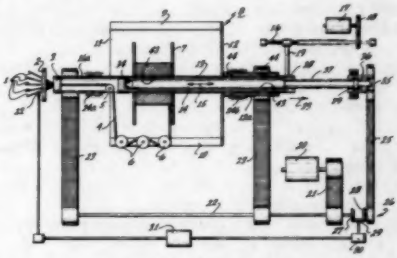
Georg Adelhard, Nuremberg; Herbert Hasselberg, Lauf; Manfred Obermeier, Eckental; Karl Sierwald, Vaterstetten, all of Fed. Rep. of Germany; Jozsef Szedlacsek, and Gyorgy Somogyi, both of Miskolc, Hungary, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany and Diosgyori Gepgyar, Miskolc, Hungary

Filed May 7, 1982, Ser. No. 375,724

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111872

Int. Cl.³ D07B *3/08, 7/10;* D65H *54/02*

U.S. Cl. 57—71 **11 Claims**



1. A single-twist stranding machine including stranding means for stranding, bunching and twisting together a plurality of elongated elements such as filaments, wires, conductors or the like, a rotatably mounted take-up spool onto which the stranded-together elements are wound, a flyer coaxial with the spool and including a frame and deflection pulleys to run the stranded-together elements from the stranding means to the spool, the flyer revolving about the spool, and drive means for providing rotation, the improvement comprising:

a differential gear transmission having two input gears and an output gear;

first transmission means for drivingly connecting the drive means to the flyer, one of the input gears of the differential gear transmission being connected to the first transmission means;

second transmission means for drivingly connecting the output gear to the spool for causing the spool to rotate;

a control drive drivingly connected to another one of the input gears to provide thereto incremental rotation augmenting the rotation of the first input gear to, thereby, vary the rotational output gear; and

means responsive to the speed of at least one of the elongated elements for controlling the control drive.

4,389,839

REINFORCING CORD FOR ELASTOMERIC ARTICLES, SHAPED ARTICLES OF REINFORCED ELASTOMERIC MATERIAL, MORE PARTICULARLY PNEUMATIC TIRES FOR VEHICLES, AND A PROCESS FOR THE MANUFACTURE OF REINFORCING CORD AND A PROCESS FOR THE MANUFACTURE OF VEHICLE TIRES

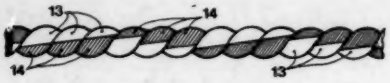
Oebele P. van der Werff, Doetinchem, Netherlands, assignor to Akzo nv, Netherlands

Filed Jan. 7, 1981, Ser. No. 223,150

Claims priority, application Netherlands, Jan. 16, 1980, 8000265

Int. Cl.³ D02G 3/38, 3/40, 3/48

U.S. Cl. 57—238 25 Claims



1. A reinforcing cord for elastomeric articles, which cord is built up from at least two endless filament bundles which are twisted or laid together and comprising two different materials, in which the cord is built up of at least two groups which each contain at least two filament bundles and that in each group at least one filament bundle is of poly-paraphenylene terephthalamide and at least one filament bundle is of viscose rayon, the filament bundles of poly-paraphenylene terephthalamide having the following characteristics:

an inherent viscosity of at least 2.5, and preferably at least 3.5 and less than 7;

a tenacity of at least 10 cN/dtex, and preferably at least 17 cN/dtex and less than 40 cN/dtex;

an elongation at rupture of at least 2.7%, by preference at least 3.4% and less than 6%;

a specific 1%-LASE value of at least 2.8 cN/dtex, and preferably at least 3.5 cN/dtex and less than 15 cN/dtex; and

the filament bundles of viscose rayon having the following characteristics;

a tenacity of at least 3 cN/dtex, and preferably about 5 cN/dtex and less than 12 cN/dtex;

an elongation at rupture of at least 8%, and preferably about 13% and less than 25%;

a specific 5%-LASE value of at least 1.5 cN/dtex, and preferably about 2.5 cN/dtex and less than 20 cN/dtex.

4,389,840

METHOD OF AUTOMATICALLY DOFFING THE FULL BOBBIN PACKAGES FROM, AND DONNING THE EMPTY BOBBIN TUBES ONTO, THE SPINDLES OF A PREPARATORY SPINNING MACHINE

Emil Briner; Peter Novak; Bruno Tanner, all of Winterthur, and Hermann Gasser, Frauenfeld, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

PCT No. PCT/EP80/00040, § 371 Date Mar. 10, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00264, PCT Pub. Date Feb. 5, 1981

PCT Filed Jun. 30, 1980, Ser. No. 243,947

Claims priority, application Switzerland, Jul. 10, 1979, 6420/79

Int. Cl.³ D01H 9/04

U.S. Cl. 57—267 17 Claims

1. A method of automatically doffing full bobbin packages from and donning empty bobbin tubes onto spindles of a preparatory spinning machine equipped with at least one row of spindles and flyers, each flyer being rotatably supported at a flyer head above a related spindle and comprising two flyer arms and a flyer yoke, comprising the steps of:

shutting down the spinning preparatory machine with the flyers located in a same predetermined position;

pivoting all of the flyer heads in a plane extending substantially at right angles to a plane containing both flyer arms of each flyer when each said flyer is located in said same predetermined position, each flyer being pivoted into a position where the flyer yoke thereof does not obstruct vertical doffing of the full bobbin package from its related spindle;

conjointly vertically doffing the full bobbin packages from all spindles arranged in a row, while the roving is severed between the flyer and the bobbin package and there is formed a free fiber beard at the flyer;

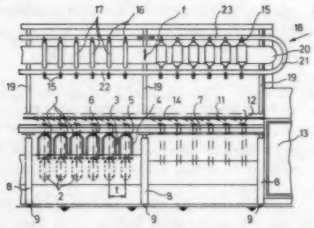
conjointly removing the bobbin packages from the doffing position located vertically above the spindles, and transferring empty bobbin tubes into the same position;

conjointly vertically donning the empty bobbin tubes onto all of the spindles arranged in a row, with the severed free fiber beard at the related flyer being clamped between a foot of the bobbin tube and its related spindle;

pivoting back all of the flyer heads into their working positions above the spindles; and

starting-up the preparatory spinning machine.

5. A preparatory spinning machine for automatically doffing full bobbin packages from and donning empty bobbin tubes



onto spindles of such preparatory spinning machine which is equipped with at least one row of spindles and with flyers, each of the flyers being rotatably supported at a flyer head above a related spindle, and each flyer comprising flyer arms and a flyer yoke, comprising:

a common support beam extending in a longitudinal direction of the preparatory spinning machine;

said flyer heads of the flyers of the spindles which are arranged in a row being supported by said common support beam;

means for imparting to said common support beam for the doffing of bobbin packages and the donning of empty tubes a translatory movement in such a manner that each flyer is substantially pivoted about an axis which substantially symmetrically intersects both flyer arms at lower regions thereof;

a doffing and donning element provided above said spindles;

means for supporting said doffing and donning element for substantially vertical up-and-down movements;

said doffing and donning element comprising for each spindle a gripper for the full bobbin and a bobbin tube support member for the empty bobbin tube; and

control means for bringing each of the flyers to standstill in a predetermined position contemplated for performing pivotal motions thereof and for effectuating the doffing operation.

4,389,841

YARN FALSE TWISTING APPARATUS

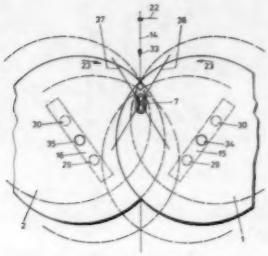
Detley Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,076

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Jul. 9, 1980, 3025921

Int. Cl.³ D02G *1/08*

U.S. Cl. 57—340 **27 Claims**



1. A yarn false twisting apparatus comprising

a frame,

a pair of twist imparting circular discs, with each disc including a yarn engaging friction surface, and with at least one of said discs being relatively thin and flexible,

means mounting said discs to said frame, with said discs being rotatable about generally parallel spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship and define a twisting zone therebetween, and including means permitting selective movement of each of said discs along a path of travel which extends in a direction generally perpendicular to its axis of rotation and generally parallel to a line which is tangent to the disc at a point immediately adjacent the twisting zone when the disc is disposed at a midpoint along its path of travel,

a pressure applying member fixedly mounted to said frame and so as to locally bias said one flexible disc toward the other disc only at said twisting zone,

drive means for rotating each of said discs about their respective axes, and such that a yarn may be continuously advanced through said twisting zone in a direction perpendicular to the plane which includes both axes of rotation of said discs, while having twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces resulting from the force exerted by the biasing means,

whereby the ratio of twist to yarn speed may be selectively varied by selective movement of said discs with respect to said pressure applying member.

4,389,842

POWER UNIT WITH GAS TURBINE

Reinhard Behnert, Bremen, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,144

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012388

Int. Cl.³ F02C *3/08*; F02K *3/02*

U.S. Cl. 60—39.36 **4 Claims**

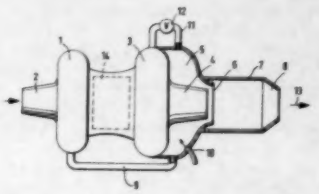
1. A drive and power unit, comprising:

a gas turbine having a central discharge duct;

a compressor drivingly connected to said turbine;

an annular injection chamber with centrifugal action surrounding in part said turbine and said discharge duct, and having its outer wall constructed to have have a diameter reduction in axial direction to become an annular nozzle that surrounds said discharge duct, the extension of the discharge duct constituting an inner boundary for establishing the nozzle is an annular configuration;

first conduct means connecting the compressor to said chamber for feeding thereto air as compressed by said compressor;



fuel injection means for and connected to said chamber; and

second conduct means for feeding a portion of combustion gases as produced by combustion in said chamber, to said turbine for driving same, the remainder of the combustion gases being discharged via said nozzle.

4,389,843

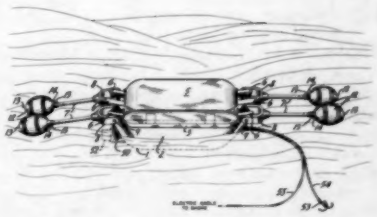
WATER WAVE ENERGY TRANSDUCER

John Lamberti, 1186 Broadway, New York, N.Y. 10001

Filed Mar. 27, 1981, Ser. No. 248,226

Int. Cl.³ F03B *13/12*

U.S. Cl. 60—507 **11 Claims**

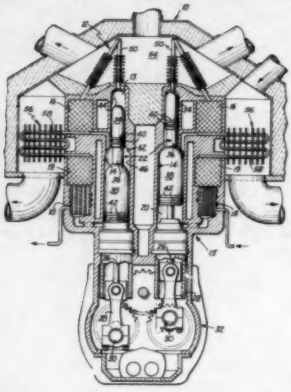


1. A water wave energy transducer comprising a floating vessel having a bow and a stern, a set of three laterally spaced forwardly extending support means at the bow of said vessel and a set of three laterally spaced rearwardly extending support means at the stern of said vessel, each of said sets comprising a port side support, a central support, and a starboard side support, a first shaft extending between and rotatably supported by said port side support and said central support, a second shaft extending between and rotatably supported by said starboard side support and said central support, said first and second shafts being aligned but independently rotatable, a bifurcated fitting fixed on each of said shafts, an arm having an inboard end fixed to each of said bifurcated fittings and having a float on its outboard end, said arms at the stern of the vessel extending rearwardly and said arms at the bow of the vessel extending forwardly, a drive gear rotatably mounted in said vessel, and power transmitting means coupling said shafts with said drive gear, said power transmitting means including means for converting independent oscillatory movement of said shafts produced by rising and falling of said floats and pitching and/or rolling of said vessel into undirectional rotary motion of said drive gear.

4,389,844
TWO STAGE STIRLING ENGINE

Robert A. Ackermann, and Nicholas G. Vitale, both of Schenectady, N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,568
Int. Cl.³ F02G 1/04
U.S. Cl. 60—517 2 Claims



1. A heat engine for utilizing intermediate temperature heat and high temperature heat for high efficiency heat utilization, wherein the improvement comprises:

a vessel enclosing a working space adapted to be charged with a working fluid;

said working space having a compression space and a two stage expansion space including a high temperature expansion space and an intermediate temperature expansion space, for expanding the heated fluid against a movable piston to produce work output;

a two stage displacer reciprocally mounted in said working space for displacing the working fluid between said compression space and said expansion space through two partially separate and partially overlapping fluid paths;

two separate heaters for receiving the fluid from, and passing fluid to said expansion space, including a high temperature heater for heating the working fluid to be expanded in said high temperature expansion space with heat received from a high temperature heat source, and an intermediate temperature heater for heating the working fluid to be expanded in said intermediate temperature expansion space with heat received from an intermediate temperature heat source;

a first regenerator in series with said high temperature heater for receiving heated fluid from, and passing regeneratively heated fluid to, said high temperature heater, and for cyclically removing heat from said fluid, storing the heat and returning the heat to the fluid on the return flow;

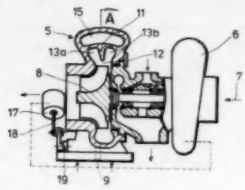
a second regenerator in said fluid path for receiving heated fluid from, and passing regeneratively heated fluid to, said intermediate temperature heat exchanger; and

a cooler for cooling and passing regeneratively cooled fluid from said second regenerator to said compression space, and for recooling said fluid after compression and passing it to said second regenerator under the influence of said displacer.

4,389,845
TURBINE CASING FOR TURBOCHARGERS

Takaaki Koike, Hachioji, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,369
Claims priority, application Japan, Nov. 20, 1979, 54-161014[U]; Feb. 13, 1980, 55-16416; Feb. 20, 1980, 55-20217
Int. Cl.³ F02D 23/00; F01D 25/24
U.S. Cl. 60—602 1 Claim



1. A turbine casing for turbochargers having a turbine wheel, comprising:

(a) a first radially inward casing wall having an appended integral centrally positioned partition wall extending radially inward therefrom, said casing wall with said partition wall being formed to establish a first radially inward partially divided scroll surrounding substantially half of the periphery of the turbine wheel for service as first and second side-by-side exhaust passages in the axial direction of the shaft of said turbine wheel so that separate flows of exhaust gases from an engine may be directed through respective said passages to the portion of said turbine wheel surrounded by said first scroll;

(b) a second radially outward casing wall formed integral with and surrounding the entirety of said first casing wall, said second casing wall being formed to establish a second scroll located radially outward from said first scroll and utilizing said first casing wall as a portion of the boundary thereof, said second scroll being separated from and surrounding a major portion of said first scroll and having a terminal portion surrounding a further minor portion of the periphery of said turbine wheel additional to the portion surrounded by said first scroll, said second scroll thereby being adapted for service as a third exhaust passage surrounding and separated from said first and second exhaust passages so that a separate flow of exhaust gases from an engine may be directed through said third passage to said minor portion of said turbine wheel surrounded by said second scroll;

(c) casing structure formed integral with said first and second casing walls and providing a common inlet to said first and second scrolls for exhaust gases from an engine; and

(d) control valve means for selectively controlling the flow of the exhaust gases from said inlet to said second scroll while maintaining the flow of such gases to said first scroll.

4,389,846
AIR SUPPLY AND FUEL VOLUME CONTROL ARRANGEMENT FOR AN AUXILIARY COMBUSTION CHAMBER OF A SUPERCHARGED INTERNAL COMBUSTION ENGINE

Franz Butscher, Friedrichshafen, Fed. Rep. of Germany, assignor to Motor-und Turbinen-Union GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 86,679, Oct. 19, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,369
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1978, 2848199
Int. Cl.³ F02C 6/12
U.S. Cl. 60—606 7 Claims

1. In an arrangement for an internal combustion engine

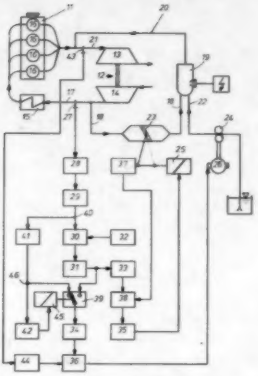
having a means for supercharging the engine comprising an exhaust gas turbine and a compressor,

a control mechanism comprising

an auxiliary combustion chamber for supplying additional exhaust gas to the exhaust gas turbine.

means for metering fuel into the auxiliary combustion chamber, valve means for supplying supercharged air from said means for supercharging to said auxiliary combustion chamber,

means for comparing a signal representing a pressure of



supercharged air from said means for supercharging with a signal representing a guide parameter to produce a resultant signal,

means for controlling the valve means in response to the resultant signal,

further means for controlling the means for metering in response to the resultant signal,

means for generating an output signal upon the pressure of said supercharged air passing a limit value of pressure, and

means for interrupting the operation of the further means in response to said output signal.

4,389,847

METHOD FOR THE RAPID INCREASE IN OUTPUT OF A STEAM TURBINE PLANT

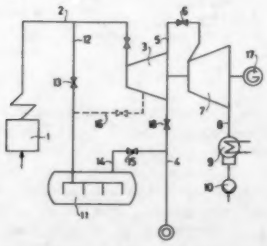
Rolf Kehlhofer, Dielsdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 30, 1980, Ser. No. 192,474

Claims priority, application Switzerland, Oct. 5, 1979, 9000/79

Int. Cl.³ F01K *3/00*

U.S. Cl. 60—659 **3 Claims**



1. Method for the rapid increase in output of a steam turbine plant using process steam, and in particular of a steam turbine plant connected with an electro-generator, comprising:

drawing off, during normal operations, the necessary process steam from a bleeder of one turbine;

simultaneously filling, or maintaining full, with steam from at least one drawing-off point of the high-pressure component of a turbine and/or with live steam, a steam accumulator; and,

interrupting the drawing off of the process steam from the turbine and replacing the interrupted turbine process steam with process steam from the steam accumulator, for the purpose of rapidly increasing the output of the steam turbine plant so that the condensing component of the turbine or a condensing turbine, respectively, immediately receives an increased flow of steam.

4,389,848

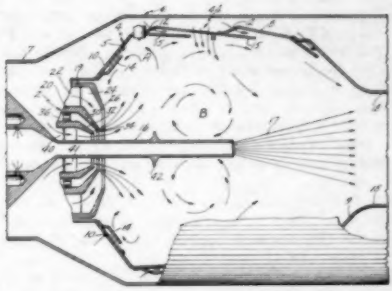
BURNER CONSTRUCTION FOR GAS TURBINES

Stanley J. Markowski, East Hartford; Ronald A. Jeroszko, Hebron, and Robert P. Lohmann, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,408

Int. Cl.³ F02C *7/22*

U.S. Cl. 60—738 **8 Claims**



6. A burner construction including:

an inlet end cap;

a central secondary fuel and air nozzle in said end cap having a discharge end spaced from the end cap and located within the burner;

an annular primary fuel nozzle surrounding said secondary fuel nozzle, said primary nozzle including swirling discharge means for mixing with the fuel and causing the mixture to be discharged in a wide angled spray;

sidewalls extending downstream from the edges of the end cap;

said sidewalls having a row of relatively large holes therein at a point and upstream of the discharge end of the secondary nozzle for introducing conbustion/dilution air substantially radially of the burner and substantially to the secondary nozzle; and

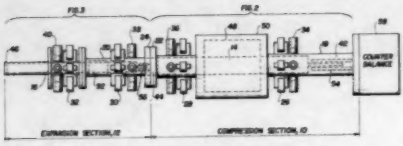
a trip on and surrounding the secondary nozzle at a point upstream of said row of holes, said trip serving to enhance the outward movement of the mixture of primary fuel and air with the dilution air to improve the recirculation adjacent the end cap and to enhance recirculation of the dilution air that is directed in an upstream direction as it impinges on the tube.

4,389,849

STIRLING CYCLE CRYOGENIC COOLER

Max G. Gasser, Rockville, Md.; Allan Sherman, Lanham, Md.; Philip A. Studer, Silver Spring, Md.; Alexander Daniels, Briarcliff Manor, and Michael P. Goldowsky, Valhalla, both of N.Y. Assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 2, 1981, Ser. No. 308,204
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **30 Claims**



5. Cooling apparatus, comprising in combination:

a reciprocally operable compressor piston (**14**) located in a generally cylindrical compressor section housing (**18**) and including a working fluid compression space (**44**) at one end thereof, said compression space being variable in accordance with the position of the piston in said housing;

a reciprocally operable displacer (**16**) located in a generally cylindrical expansion section housing (**20**) and including a working fluid expansion space (**46**) at one end thereof, said expansion space being variable in accordance with the position of said displacer;

said housings (**18, 20**) being interconnected and including a working fluid and having means (**95, 98, 100, 101, 102, 103, 104, 105, 106**) for the flow of working fluid between said compression space (**44**) and said expansion space (**46**);

drive motor means (**48, 52**) coupled to said compressor piston (**14**) and said displacer (**16**) and being operable to provide mutual reciprocation of said piston and said displacer in a controlled phase relationship to effect a predetermined cooling cycle by the compression and expansion of said working fluid;

non-contacting bearing means (**26, 28, 30, 32**) located on said housings (**18, 20**) and being operable to radially center said piston (**14**) and said displacer (**16**) in their respective said housings; and

non-contacting seal means (**84, 108**) for restricting undesired flow of said working fluid around said piston (**14**) and said displacer (**16**);

said non-contacting bearing means and said non-contacting seal means being operable to eliminate physical contact between said piston (**14**) and its respective housing (**18**) and said displacer (**16**) and its respective housing (**20**), thereby providing long operational life and non-contamination of the working fluid.

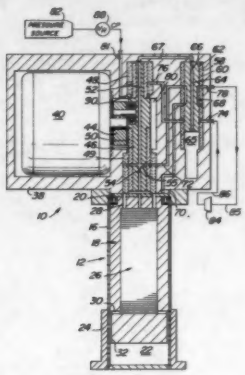
4,389,850

HYBRID CRYOGENIC REFRIGERATOR

Domenico S. Sarcia, Carlisle, Mass., assignor to CVI Incorporated, Columbus, Ohio

Filed Apr. 19, 1982, Ser. No. 369,862
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **11 Claims**

1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigerant fluid is circulated in a fluid flow path between said first chamber and said second chamber by the movement of said displacer means controlled in part through the introduction of high-pressure fluid and the discharge of low-pressure fluid, the improvement comprising chamber means for guiding a slide connected to the displacer means, said slide having an axial passage communicating with one end of said chamber means remote from the displacer means, a motor coupled to said slide for controlling movement of the displacer means adjacent top dead center and bottom dead center positions thereof, a fluid reaction surface on said slide intermediate its ends, means for applying pressure to said surface for overriding said motor when the slide is spaced from top dead center, said passage in said slide having a restriction,



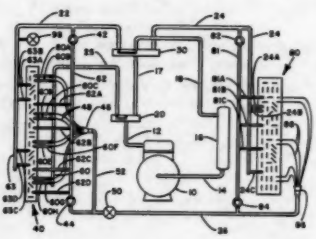
a valve having a spool valve member for controlling flow of the high and low pressure fluid, means including a conduit communicating one end of said spool valve member with said one end of said chamber means for introducing high fluid pressure into the conduit to shift the spool valve member when the displacer means is at one of the extremities of its movement.

4,389,851

METHOD FOR DEFROSTING A HEAT EXCHANGER OF A REFRIGERATION CIRCUIT

Ronald F. Chrostowski, Liverpool; Rudy C. Bussjager, Syracuse, and James J. Del Toro, North Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 112,876, Jan. 17, 1980, Pat. No. 4,313,313.
This application Aug. 3, 1981, Ser. No. 289,342
Int. Cl.³ F25D 21/06
U.S. Cl. 62—81 **5 Claims**



1. A method of defrosting a refrigeration system having a closed refrigeration circuit including a first heat exchanger, a second heat exchanger, an expansion device, a compressor and interconnecting lines which comprises the steps of:

sensing a frost accumulation on the second heat exchanger;

diverting in response to a need for defrost being sensed hot gaseous refrigerant from the compressor to the second heat exchanger bypassing the first heat exchanger;

preventing the refrigerant in the first heat exchanger from flowing to the second heat exchanger during the step of diverting;

discontinuing the steps of diverting and preventing after a

predetermined time interval or upon the step of sensing detecting no further need for defrost; and

switching the reversing valve to change the mode of operation of the refrigeration circuit simultaneously with or after the step of discontinuing if the predetermined time period has elapsed and the step of sensing continues to detect a need for defrost.

4,389,852

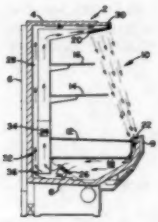
ONE AND A HALF BAND REFRIGERATED DISPLAY CASE

Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 76,669, Sep. 18, 1979, which is a continuation-in-part of Ser. No. 60,459, Jul. 25, 1979, and Ser. No. 70,882, Aug. 29, 1979. This application Feb. 25, 1980, Ser. No. 124,544

Int. Cl.³ A47F 3/04

U.S. Cl. 62—82 **38 Claims**



1. A refrigerated display case for displaying refrigerated products, said display case comprising:

a cabinet having an interior display space and an access opening for enabling access to refrigerated products within said display case;

a first air conduit extending around said cabinet so as to have an inlet opening at one end of said access opening and an outlet opening at the other end of said access opening, said inlet and outlet openings being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening;

refrigeration means arranged within said first air conduit for refrigerating air passing through said first air conduit by contact with refrigeration coils located therein;

air circulating means arranged within said first air conduit for circulating air through said first air conduit in a forward direction during a refrigeration cycle or operation so that air is expelled from said outlet opening, travels across said access opening and returns into said first air conduit through said inlet opening;

a second air conduit extending partially around said cabinet in a position lying outlwardly from said first air conduit, said second air conduit having an outlet opening arranged adjacent to the outlet opening of said first air conduit;

said refrigeration means having a lower part of the refrigeration coils thereof located in an upstream air flow position to the inner portion of said second air conduit; and

said second air conduit having an air inlet opening located downstream from said lower part of said refrigeration coils so that during a refrigeration cycle of operation such inlet opening receives two portions of air passing through said first air conduit with only a first inner portion of such air having passed over said lower refrigeration coils part of said refrigeration means and with a second outer portion of air flowing directly from said first air conduit into said second air conduit without passage through said lower refrigeration coils so that the air flowing out of said second conduit and across said second opening at a distance spaced below said outlet opening of said second air conduit has a temperature gradient with the inner portion of such air flow being substantially colder than the outer portion and being at a lower temperature than in the absence of contact with said lower part of said refrigeration coils.

4,389,853

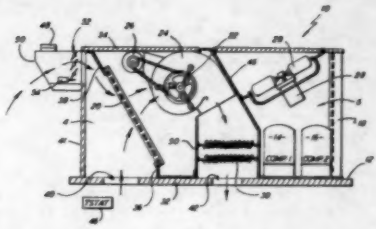
METHOD AND APPARATUS FOR CONTROLLING AN AIR CONDITIONING UNIT WITH MULTI-SPEED FAN AND ECONOMIZER

James R. Hile, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,057

Int. Cl.³ F25D 17/06

U.S. Cl. 62—89 **13 Claims**



1. A method of controlling the operation of an air conditioning unit including an adjustable volume air handling means for supplying air to an enclosure to be conditioned and an economizer having adjustable dampers in addition to a refrigeration circuit which comprises the steps of:

sensing the temperature of the enclosure to be conditioned;

generating a signal indicative of the difference between the desired temperature for the enclosure and the temperature sensed;

sensing ambient air conditions;

positioning the dampers of the economizer to allow ambient air to enter the unit when the ambient air conditions warrant circulating outside air to the enclosure to effect cooling of the enclosure;

energizing the air handling means in response to the signal at a reduced volume flow rate if ambient air conditions do not warrant economizer operation; and

energizing the air handling means in response to the signal at an increased volume flow rate if ambient air conditions warrant economizer operation.

4,389,854

HIGH SPEED FREEZING SYSTEM FOR A REFRIGERATOR

Yasuhiro Ogita, Kyoto; Kazuya Kawasaki, Ibaraki; Kouichi Nagao, Ibaraki, and Naoki Mori, Ibaraki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1981, Ser. No. 306,642

Claims priority, application Japan, Oct. 3, 1980, 55-139126

Int. Cl.³ G05D 23/32; F25D 29/00

U.S. Cl. 62—157 **13 Claims**

1. A freezing apparatus for a refrigerator having a cold chamber and a freezing chamber, comprising:

(a) first and second cooling means respectively disposed in said cold and freezing chambers for cooling the inner spaces of said cold and freezing chambers, respectively, said first and second cooling means being coupled in series between both ends of a series arrangement of a compressor and a condenser, said compressor being intermittently operated for delivering a refrigerant;

(b) electromagnetic valve means coupled in parallel to said first

cooling means, which is operated to selectively form a first flow mode and a second flow mode, said first flow mode permitting said refrigerant to flow to both said first and second cooling means and said second flow mode permitting said refrigerant to flow only to said second cooling means;

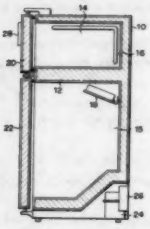
(c) signal generating means for generating a first electrical signal for designating said second flow mode to start rapid freezing, said signal generating means including a rapid freezing switch having a switch knob protruding at least partially from the outer surface of said refrigerator to allow for manual operation by an operator;

(d) detecting means connected to said compressor for detecting an operating condition of said compressor, for generating a first detection signal of high level during refrigerant delivering operation of said compressor and for generating a second detection signal of low level while said compressor is stopped;

(e) flip-flop circuit means connected to said signal generating means, for generating a rapid freezing initiating signal in response to said first electrical signal;

(f) switching means connected to said flip-flop circuit means, said compressor and said valve means, for performing a switching operation to control power supply to said compressor and valve means in response to said rapid freezing initiating signal;

(g) start failure preventing circuit means connected to said detecting means for alternately receiving said first and second detection signals, for detecting a signal level change from high to low, which is caused when said compressor



stops, for generating a second electrical signal of low level until a predetermined time passes from the time when said signal level change occurs and for generating a third electrical signal of high level after said predetermined time passes, said start failure preventing circuit means comprising delay circuit means and a diode, said delay circuit means being connected between said detecting means and gate means and including an inverter which receives said first and second detection signals alternately supplied from said detecting means to convert the potential levels of said first and second detection signals and a delay circuit which starts charging when receiving a high level voltage signal from said inverter, generates said second electrical signal during a charging period and discharges at a time constant corresponding to said predetermined time to generate said third electrical signal, and said diode being connected in parallel to said delay circuit for passing therethrough said first detection signal and generating said first detection signal as said second electrical signal when receiving said first detection signal from said detecting means;

(h) gate means, connected to said flip-flop circuit means and said start failure preventing means and having a first input for receiving said rapid freezing initiating signal and a second input for receiving said second and third electrical signals, for allowing said rapid freezing initiating signal to pass therethrough while receiving said third electrical signal from said start failure preventing circuit means and for preventing said rapid freezing initiating signal from passing therethrough while receiving said second electrical signal; and

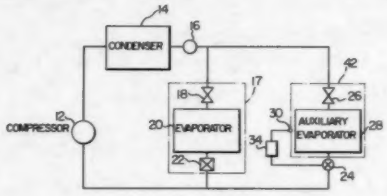
(i) switching means connected to said gate means, compressor and valve means, for receiving said rapid freezing initiating signal through said gate means and for controlling power supply to said compressor and valve means in response to said rapid freezing initiating signal, whereby even when said flip-flop circuit means generates said rapid freezing initiating signal before said predetermined time passes from the time when said compressor stops said refrigerant delivering operation, said rapid freezing initiating signal cannot be transmitted to said switching means so that said compressor is prevented from restarting.

4,389,855

DUAL AIR-CONDITIONER FOR MOTOR-CARS

Toshimichi Ueda; Akira Tezuka, both of Katsuta; Seiichi Wakairo, Kasama; Moriyuki Sakuma, Katsuta, and Masashi Mochizuki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,107
Claims priority, application Japan, Aug. 8, 1980, 55-108292
Int. Cl.³ F25B *5/00*
U.S. Cl. 62—200 **4 Claims**



1. A dual air-conditioner comprising:

compressor means for compressing and exhausting a refrigerant gas for a refrigerating cycle;

condenser means for liquidizing the compressed refrigerant gas from said compressor;

expansion means for subjecting the refrigerant liquid from said condenser to adiabatic expansion so as to cause the refrigerant liquid to be in the form of mist;

evaporator means for subjecting the refrigerant in the form of mist from said expansion means to heat exchange with air so as to cool the air and for returning the refrigerant gas having experienced the heat exchange to said compressor means;

said evaporator means including a main evaporator and an auxiliary evaporator connected by piping in parallel with each other;

said expansion means including a first expansion unit provided in a first upstream piping of said main evaporator and a second expansion unit provided in a second upstream piping of said auxiliary evaporator, said second expansion unit being an expansion valve of an internal pressure balancing type;

an electromagnetic valve provided in a first downstream piping of said auxiliary evaporator at a portion of said first downstream piping between said first auxiliary evaporator and a junction between said first downstream piping and a second downstream piping of said main evaporator; and

means for controlling the opening of said electromagnetic valve in accordance with the operation state in the refrigerating cycle so as to control balancing pressure acting on said internal pressure balancing type expansion valve to thereby control the flow rate of the refrigerant flowing into said auxiliary evaporator, said controlling means comprises a temperature sensor for detecting the temperature of blow-off cooled air from said auxiliary evaporator, a control circuit for controlling an opening and closing of

said electromagnetic valve in accordance with an output of said temperature sensor including difference setting means for setting a predetermined difference for the open and close operation of the electromagnetic valve and for adjusting output characteristics of said temperature sensor.

4,389,856

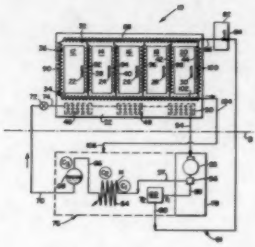
REFRIGERANT GAS HEATER SYSTEM FOR DISPLAY CABINETS

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 162,203, Jun. 23, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,625

Int. Cl.³ A47F *3/04*; F25B *47/00*

U.S. Cl. 62—248 **50 Claims**



19. A display cabinet refrigeration and heater system comprising:

refrigeration means associated with a portion of the structure of said cabinet and including an expansion valve and evaporation coils; said refrigeration means serially connected within a refrigeration circuit; said circuit containing a compressor for enabling refrigerant flow and energy input and a condenser located at a remote position from said cabinet; a refrigerant gas heater system having an auxiliary refrigerant gas flow line located in heat exchange contact with a cooled portion of said cabinet structure; said auxiliary gas flow line connected by a first portion thereof to said refrigeration circuit at a refrigerant gas sourcing point downstream from said compressor and at an upstream position from said condenser; a desuperheating means connected to said first portion of said flow line for lowering the temperature of said gas; an inlet end of said gas flow line containing desuperheated refrigerant gas at a temperature within the range of about 80° F. to 130° F. and a pressure at least equivalent to the equilibrium saturated vapor pressure at 50° F., said gas flow line providing heat for the contacted portion of said cabinet structure by transfer of sensible heat and the latent heat of condensation thereof, and said auxiliary gas flow line connected by the outlet end thereof to said refrigerant circuit at a position downstream from said gas sourcing point.

4,389,857

HEAT EXCHANGER

Biarne R. Svendsen, Copenhagen, Denmark, assignor to Genvex Energiteknik A/S, Denmark

PCT No. PCT/DK80/00049, § 371 Date Apr. 21, 1981, § 102(e) Date Apr. 14, 1981, PCT Pub. No. WO81/00616, PCT Pub. Date Mar. 5, 1981

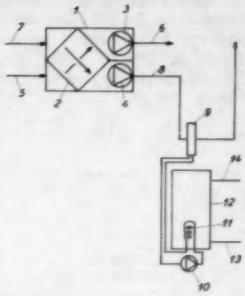
PCT Filed Aug. 21, 1980, Ser. No. 253,934

Claims priority, application Denmark, Aug. 21, 1979, 3482/79

Int. Cl.³ F25B *29/00*

U.S. Cl. 62—325 **6 Claims**

1. A heat exchanger system in a house arranged for the transfer of heat from exhaust air into fresh air to be supplied to the house or the transfer of heat in the opposite manner comprising means for creating a flow of exhaust air from the interior of the house, means for further creating a flow of fresh air from the outside to the interior of the house, means arranged to receive said exhaust flow and create a heat exchange relationship with the flow of fresh air, means connected downstream of said heat exchanger means for further cooling the flow of exhaust air exiting therefrom said further cooling means includes a heat pump circuit, said heat pump circuit having an evaporator being arranged in the flow of the exhaust air from said heat exchanger means and a condenser operatively connected to said evaporator and wholly submerged in the water of a water tank which is a tank holding hot tap water for the house, said condenser heating the tap water of the tank in response to the action of said condenser cooling the flow of exhaust air.



4,389,858

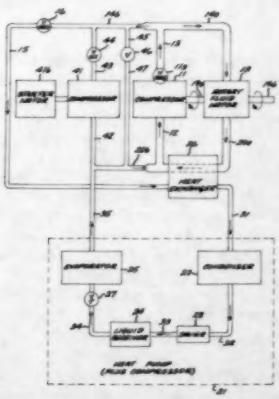
HEAT ENGINE

Henry E. Jepsen, 10360 Santa Gertudes #36, Whittier, Calif. 90603

Filed Dec. 3, 1981, Ser. No. 304,071

Int. Cl.³ F25B *1/00*

U.S. Cl. 62—498 **9 Claims**



1. A heat-activated refrigeration system for performing shaft-work comprising:

a rotary fluid motor having an inlet for a refrigerant gas, an outlet for said refrigerant and a power take-off shaft to obtain work from said rotary fluid motor;

a refrigerant compressor means having an inlet for said

refrigerant, an outlet for said refrigerant and a rotatably mounted shaft by which said compressor may be driven;

connecting means between said shaft of said compressor and said shaft of said rotary fluid motor by which said compressor is driven by said rotary fluid motor;

heat pump means to absorb heat from an ambient source;

a refrigerant flowing through said heat pump, said compressor and said rotary fluid motor;

connecting means by which refrigerant flow from said heat pump and the outlet of said rotary fluid motor are connected to the inlet of said compressor; and

connecting means by which the inlet of said heat pump and the inlet port of said fluid motor are connected to the outlet port of said compressor whereby the flow rate of said refrigerant is regulated.

4,389,859

KNITTING MACHINE

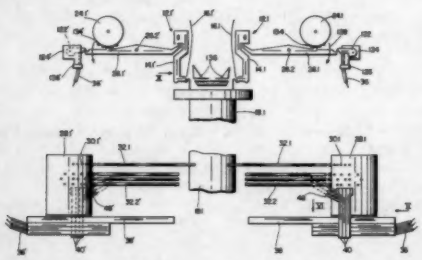
Herbert F. Huisl, Tableview, South Africa, assignor to Colosio Cesare, Botticino Sera, Italy

Filed Aug. 4, 1980, Ser. No. 174,909

Claims priority, application South Africa, Aug. 6, 1979, 79/4062; Sep. 7, 1979, 79/4727

Int. Cl.[3] D04B 9/28, 15/60

U.S. Cl. 66—224 5 Claims



1. A knitting machine for knitting tubular knitted wear such as socks, which includes a rotatable needle knitting cylinder; a number of pattern drums each drum capable of mounting pattern pins; a number of needle selector bars adapted to be operated by the pattern drums and in turn being adapted to operate needles in the knitting cylinder; a number of yarn feeder control drums controlled from a timing chain; yarn feeders for each yarn feeder control drum which yarn feeders are adapted to supply yarn to the needle knitting cylinder; the machine further including an additional yarn feeder control arrangement which includes a control member for controlling each yarn feeder separately from the said corresponding yarn feeder control drum; movement means adapted to be moved by the associated pattern drum of the yarn feeders; and coupling means adapted to be operated by the movement means and being adapted to transmit movement of the movement means to the control member for causing a particular control to be effected on its associated yarn feeder; the movement means including a first lever for each yarn feeder to be controlled, the lever being adapted to be moved by pins provided on the pattern drum, the first lever being adapted to pivot a slidable lever into an operative position; the slidable lever being adapted to be moved by means of the rotation of the needle knitting cylinder for causing movement of the control member via the coupling means.

4,389,860

WARP KNITTING MACHINE FOR THE PRODUCTION OF JACQUARD-PATTERNED PILE-KNIT FABRICS

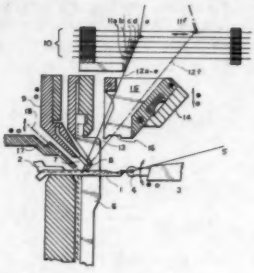
Manfred Schneider, Karl-Marx-Stadt, German Democratic Rep., assignor to Textima VEB Wirkmaschinenbau Karl-Marx-Stadt Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 40,051, May 17, 1979. This application Apr. 15, 1981, Ser. No. 254,392

Claims priority, application German Democratic Rep., Jun. 8, 1978, 205858

Int. Cl.[3] D04B 23/06

U.S. Cl. 66—84 R 15 Claims



1. Warp knitting machine for the production of Jacquard patterned knit-pile fabrics, comprising a row of slide needles each having a needle stem and a needle hook; a guide bar including knitting yarn carriers; a plurality of pile yarn carriers assigned to each needle; means for the selection of the respective pattern forming pile yarn; means for tucking the non-selected pile yarns; means for inserting the selected pattern forming pile yarn into a needle hook; pile sinkers for holding the pile loop formed between successive rows of stitches; said pile yarn carriers being movable relative to each other so that the selected pattern forming pile yarn forms with the non-selected pile yarns a shed, the tip of which is located at the knock-over point in the plane of respective needle stems; and a guide reed having sinkers provided respectively with an insertion edge, extending in parallel to said needles, said reed being arranged between said pile yarn carriers and said pile sinkers to cross said shed and to perform a lateral racking movement so that said edge overlays said pattern forming pile yarn.

4,389,861

MACHINE ADAPTED FOR USE IN THE MANUFACTURE OF SHOES

Alan M. Peck, Beverly, Mass.; Kingsley J. Tutt, Birstall, and Graham J. Mansfield, Oadby, both of England, assignors to USM Corporation, Farmington, Conn.

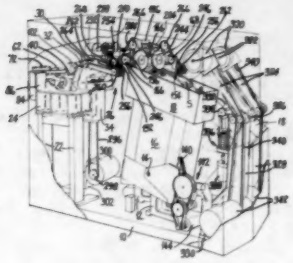
Filed Jun. 8, 1981, Ser. No. 271,586

Int. Cl.[3] C14B 1/44

U.S. Cl. 69—6.5 6 Claims

1. In a machine for performing marginal roughing and toe scouring operations on shoe bottoms comprising a shoe support for supporting a shoe, bottom uppermost, roughing tool supporting means for supporting a roughing tool, between which shoe support and roughing tool supporting means relative movement can take place, lengthwise, widthwise and heightwise of the bottom of a shoe supported by the shoe support, whereby a roughing tool supported by the roughing tool supporting means is caused to operate progressively along marginal portions of the shoe bottom, and toe scouring tool supporting means between which and the shoe support relative lengthwise and heightwise movement can be effected thus to cause the toe end portion of the bottom of a shoe supported by the shoe support to be scoured: the improvement in that a first

stepping motor is provided for effecting relative lengthwise movement between the shoe support and the scouring tool supporting means, a further stepping motor is provided for effecting relative heightwise movement therebetween, and computer control means is provided by which drive signals are generated and supplied to said stepping motors in accordance



with a programmed instruction, so that a scouring tool supported by the scouring tool supporting means is caused to follow a pre-determined path lengthwise and heightwise of the shoe bottom, whereby to control the amount of material remaining after the scouring operation has been effected on the shoe bottom.

4,389,862

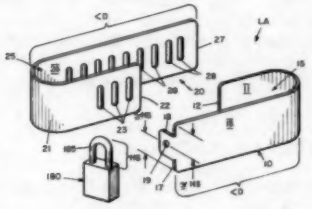
HIGH SECURITY LOCKING ASSEMBLY FOR LOCKRODS TYPE REAR-END CLOSURES OF CARGO VEHICLES

Thomas M. Hastings, 9708 Valaretta Dr., Gretna, Nebr. 68028

Filed Sep. 23, 1980, Ser. No. 189,762

Int. Cl.³ E05B *63/14, 65/16*; E05C *19/08, 19/18*

U.S. Cl. 70—2 **9 Claims**



1. In removable combination with a cargo carrying vehicle wherein the closure therefor comprises a pair of upright lockrods having a finite lateral-spacing at closed condition, the lockrods being relatively laterally movable whereby entrance into the cargo compartment is attainable only by moving one lockrod laterally away from the other lockrod, a high security locking assembly for said cargo compartment closure and comprising:

A. an upright primary J-hook member including a relatively long leg attached to a parallel and directionally transversely separated relatively short leg attached at a curved bight for snugly removably engaging one of said lockrods, the longer leg remote of the bight carrying an upright apertured staple extending directionally transversely toward the shorter leg;

B. an upright secondary J-hook member including a relatively long leg attached to a parallel and directionally transversely separated relatively short leg attached at a curved bight for snugly removably engaging the other lockrod, at least one of the legs of the secondary member being provided with a plurality of regularly spaced upright slots, one of which receives therethrough the apertured staple of the primary member; and

C. a padlock of the type comprising a body and a U-shaped shackle and a body, said padlock is activated condition having its shackle extending through the aperture of the staple with the member legs in substantially parallel assembled relation, whereby said padlock maintains the primary and secondary J-hook members and their engaged lockrods in arrested relationship and whereby the padlock is protectably shielded by the removably associated primary and secondary J-hook members.

4,389,863

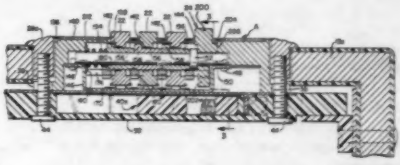
COMBINATION LOCKS

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Mar. 5, 1981, Ser. No. 240,849

Int. Cl.³ E05B *37/02*

U.S. Cl. 70—312 **6 Claims**



1. A combination lock including a plurality of combination elements disposed coaxially on a shaft in a lock casing for axial movement in unison out of coupling engagement with cooperating combination components in order to change the combination of the lock, and a shift member mounted on said shaft adjacent a terminal one of said combination elements, said shift member including an elongate opening receiving said shaft, a manual actuating portion projecting through an opening in a wall forming part of the lock casing, and means guiding said shift member for translatory movement substantially transversely to the axis of said shaft and in a direction substantially parallel to said wall responsive to corresponding transverse movement of said actuating portion in said opening, said shift member further including a cam surface for moving said elements axially responsive to translatory movement of the shift member.

4,389,864

KEY HOLDER

Minoru Toyoda, Nagoya, Japan, assignor to Aisin Seiki Company, Limited, Kariya, Japan

Division of Ser. No. 68,568, Aug. 22, 1979. This application Dec. 5, 1980, Ser. No. 213,562

Claims priority, application Japan, Sep. 8, 1978, 53-110845; Feb. 6, 1979, 54-13025; Feb. 6, 1979, 54-13026; Feb. 6, 1979, 54-13027; Feb. 6, 1979, 54-13028; Feb. 6, 1979, 54-13029

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—456 R **8 Claims**

1. A pendant type key holder comprising:

a body including a concave portion having the configuration of said key, said concave portion including a serrated portion conforming to the serrations of said key, said concave portion further including a depressed circular portion having a depth greater than said concave portion, said depressed portion being located at the part of said concave portion corresponding to the tip of said key;

said key pivotably mounted on said body and movable between an operating position in which the key is disposed outside said body and a non-operating position in which the key is housed within said concave portion; and

biasing means connected to said body for maintaining said

key at the operating position thereof or the non-operating position thereof,

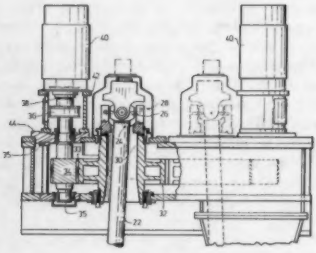
whereby said key forms an ornamental portion of said key holder when in said non-operating position.

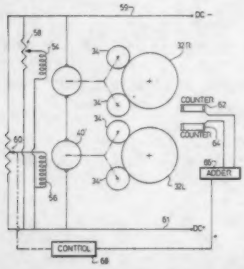
4,389,865

DRIVE SYSTEM FOR EDGER MILL

Kenneth W. Davies, Beaconsfield, Canada, assignor to Dominion Engineering Works, Ltd., Montreal, Canada

Filed Nov. 6, 1980, Ser. No. 204,447
Claims priority, application Canada, Nov. 27, 1979, 340687
Int. Cl.³ B21B *35/12, 35/04*
U.S. Cl. 72—29 **8 Claims**





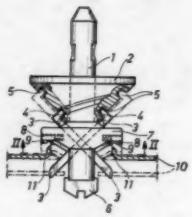
1. A convertible edger mill having a pair of spaced apart edger rolls positioned in adjustable spaced apart relation, each said roll having an elongated shaft, coupled in driving relation therewith, the improvement comprising a bull gear connected with each said shaft, said bull gears being rotatably mounted in a pair of separate housings in adjustable mutually spaced relation to permit selective positioning of the bull gears in a meshing or a non-meshing relation, each bull gear having a plurality of pinions connected in driving relation therewith, each pinion having an electrical motor in driving relation therewith, and speed control means to maintain said one edger roll within predetermined driving limits relative to the other said roll when said bull gears are positioned in said non-meshing relation.

4,389,866

APPARATUS FOR FORMING AN ENLARGED FLANGED HOLE IN A CURVED SURFACE

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Manta, Finland

Filed Jan. 21, 1981, Ser. No. 226,869
Claims priority, application Finland, Jan. 30, 1980, 800278
Int. Cl.³ B21D *19/00;* **B23B** *41/06, 51/08*
U.S. Cl. 72—71 **8 Claims**



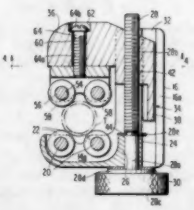
1. A flange forming drill mechanism for drilling a hole in a curved wall of a pipe or the like and for forming a flange surrounding said hole, said mechanism comprising a drill rod adapted to be attached to a rotating power source; a first drill bit for drilling an initial hole in said curved wall mounted adjacent a lower end of said rod; a second bit for enlarging said hole into elliptical shape including bit elements which are supported from said drill rod on the opposite sides thereof and have cutting edges defining a generally conical cutting path; and flange forming means supported from said drill rod for forming an upturned flange surrounding said hole.

4,389,867

TOOL FOR RESTORING ROUNDNESS TO METAL TUBING

Dallas M. Whitlock, Catlettsburg, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 17, 1981, Ser. No. 255,014
Int. Cl.³ B21B *19/12*
U.S. Cl. 72—126 **7 Claims**



1. A tool for restoring roundness to soft metal tubing, said tool comprising:

a frame member,

said frame member including at least an underlying, horizontal base and a vertical sidewall,

a head overlying said base,

said tool being open to one side to permit sidewise positioning of a soft metal tube between said head and said base,

a pair of lower rollers mounted to said base for rotation about parallel, horizontal axes, in side by side fashion at fixed axle positions,

an upper roller assembly movably mounted to said frame member, overlying said base and bearing a pair of rollers mounted for rotation about spaced, parallel horizontal axes, in side by side fashion, and at fixed axle positions on said upper roller assembly, with said upper rollers generally overlying respective lower rollers, and

means for threadably driving said upper roller assembly downwardly relative to said lower rollers to effect positive drive spacing between the upper and lower pairs of rollers with the peripheries of all four rollers in light contact with the periphery of said tube after tubular insertion into the opening such that rotation of said tube about its axis and shifting of said tube axially causes said tool to restore roundness of said tube by local deformation at areas of tube out of roundness or flatness.

4,389,868

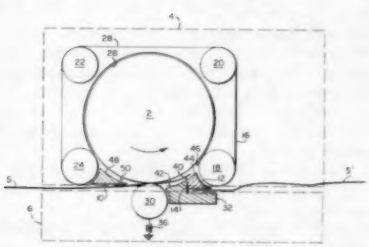
APPARATUS FOR SHEARING AND COILING STRIP MATERIAL

Robert B. Strout, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 135,795, Mar. 31, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,771

Int. Cl.³ B21C *47/10*; B65H *19/28*

U.S. Cl. 72—132 **3 Claims**



1. Apparatus for shearing and coiling strip material, said apparatus comprising a mandrel rotatable about its axis and adapted to receive said strip material on a peripheral portion thereof, first cutter means disposed proximate said mandrel in a fixed position, said first cutter means having a first guide surface thereon, and second cutter means having a first position further removed from said mandrel then said first cutter means, said second cutter means being movable to a second position adjacent said first cutter means to effect a cutting operation, said second cutter means having a second guide surface thereon, said first and second guide surfaces forming a substantially continuous entry surface when said second cutting means is in said second position, said entry surface being adapted to urge a cut end of said strip material into engagement with said peripheral portion of said mandrel.

4,389,869

SHEET METAL BENDING BRAKE

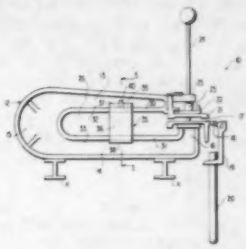
Eugene H. Van Cleave, Orchard Lake, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.

Filed Nov. 18, 1980, Ser. No. 207,944

Int. Cl.³ B21D *5/04*

U.S. Cl. 72—319 **17 Claims**

2. A sheet material bending brake comprising a plurality of "C"-shaped castings, means retaining said castings in parallel array so that each casting is perpendicular to a bending plane, clamping and bending means located at the free cantilevered ends of said castings to retain a sheet of material in bending position with a portion of the sheet projecting into the throat of the castings so that the remainder of the sheet can be bent along said plane, each casting having a pair of horizontal surfaces adjacent its throat on either side thereof, individual rigid substantially "C"-shaped clamps slidably engaging said surfaces and spanning the throat of each casting to resist spread of the castings under the clamping and bending loads imposed thereon, said "C"-shaped clamp being slidably movable toward and away from said clamping and bending means, and means carried by each clamp and engagable with the associated casting to retain said clamp in slidably adjusted position thereon.



4,389,870

FORMING ENGAGEMENT GROOVES IN A TOOL SHANK

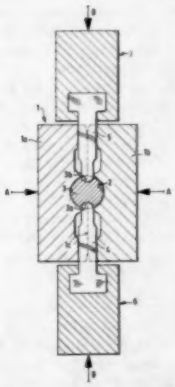
Hans Boeni, Buchs, Switzerland; Beda Meier, Schaanwald, and Gabor Szacsvay, Triesen, both of Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 23, 1981, Ser. No. 257,421

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015893

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—354 **1 Claim**



1. Device for the formation of engagement grooves in the shank of a tool for use in a hammer drill or chipping hammer, comprising a matrix having an axially elongated bore therethrough for receiving and holding the solid shank of the tool during the punching operation, said matrix is divided along a single junction plane into completely separate matrix parts each forming a coextensive axially elongated part of the bore with each axially extending bore part opening to the single

junction plane and being closed in the angular direction around the axis between the intersection of the junction plane with the bore, said separate matrix parts combining to form punching die guide openings located in the single junction plane and spaced angularly apart about the axis of the matrix bore, and a punching die insertable into each of the punching die guide openings for applying punching pressure to the shank of the tool held in the matrix bore with the punching pressure being applied in the single junction plane between the matrix parts, said matrix being divided into two symmetrically shaped matrix halves and with the single junction plane formed there between dividing the matrix bore into two axially extending symmetrical bore halves, and means for applying closing pressure to said matrix halves for holding the shank of the tool in the matrix bore with the closing pressure being applied perpendicularly to the junction plane located between said matrix halves.

4,389,871

METHOD OF PRODUCING YOKE OF ROTARY ELECTRIC MACHINE

Hidetsugu Takeuchi, Kariya; Tsuyoshi Muramatsu, and Shozo Kato, both of Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 12, 1980, Ser. No. 206,180
Claims priority, application Japan, Nov. 23, 1979, 54-152302
Int. Cl.³ B21D *22/02*
U.S. Cl. 72—356 **2 Claims**

1. A method of producing a yoke for a rotary electric machine having a cylindrical shape and formed with abutting surfaces on opposite axial ends thereof to be positioned against frames of the machine, said method comprising the steps of:

forming a cylindrical blank by extrusion forming into a semi-finished article having said abutting surfaces formed on its axially opposite ends; and

coining said abutting surfaces while said semi-finished article is on a mandrel to prevent radially inward deformation of said article but causing radially outward deformation thereof at the article ends axially inward from but adjacent said abutting surfaces while pressing inwardly on the outer periphery of said semi-finished article between said ends thereof to prevent any radially outward expansion deformation of said article between said ends while said coining causes said two abutting surfaces to have a spacing interval of high accuracy and to be square relative to said mandrel and parallel to each other.

4,389,872

TUBE BENDER CONSTRUCTION

Leonard J. Kowal, Prospect Heights, Ill., assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

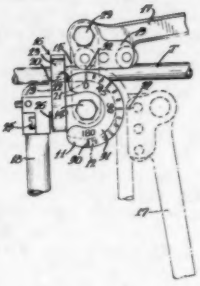
Filed Jan. 30, 1981, Ser. No. 229,862
Int. Cl.³ B21D *7/02*
U.S. Cl. 72—388 **13 Claims**

1. In a manually operable tube bender having a mandrel defining an arcuate tube-receiving bending groove extending arcuately about a bend axis from a bend start position, a forming member mounted to said mandrel to swing about said bend axis for urging a tube to be bent into said bending groove, and means for holding the tube against longitudinal displacement in said bending groove during a tube bending operation, the improvement comprising:

a support carried by the mandrel;

positioning means comprising a flat plate carried by the support defining a planar stop spaced from the bending groove bend start position at any one of a plurality of accurately preselected distances for abutment by selectively providing (a) a distal end of a straight tube portion to be bent therewith to accurately cause the bend to be spaced accurately from said distal end portion, and (b) by a bent end portion of a previously bent tube to be provided with a further bend spaced from said bent end end portion;

first scale means comprising a distance scale carried by said support;



second scale means comprising angular indicia means on said stop for indicating angular positions about the axis of the portion of the tube to be bent at said bend start position, whereby said bent end portion may be concurrently positioned in abutment with said stop and disposed in preselected angular relationship to the arcuate extent of the bending groove;

third scale means on said mandrel for indicating angular distances about said bend axis measured from said bend start position; and

fourth scale means on the mandrel differing from said third scale means for indicating angular distances about said bend axis measured from said bend start position, said mandrel defining a front face and a rear face, said first scale means being provided on said front face and said second scale means being provided on said rear face.

4,389,873

TUBE BENDER CONSTRUCTION

Albert J. Schwarz, Lincolnwood, and Leonard J. Kowal, Prospect Heights, both of Ill., assignors to Imperial Clevite Inc., Rolling Meadows, Ill.

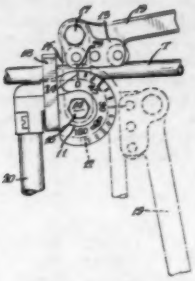
Filed Mar. 11, 1981, Ser. No. 242,598
Int. Cl.³ B21D *7/02*
U.S. Cl. 72—388 **23 Claims**

1. In a tube bender havng a form wheel defining a tube-receiving bending groove extending arcuately about a bend axis, and means for holding the tube to be bent against longitudinal movement in the bending groove during a tube bending operation, the improvement comprising:

a forming member defining a concave tube-engaging surface; and

adjustable mounting means for operatively mounting the forming member to the form wheel to swing about said bend axis outwardly adjacent said bending groove including means for adjustably moving the forming member radially of said bend axis toward said bend start point into

engagement with a tube to be bent in the bending groove thereat to have desired bending force transfer engagement



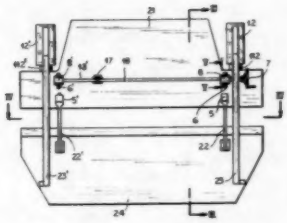
with each tube to be bent seriatim thereby notwithstanding differences in the diameters of the different tubes.

4,389,874

BENDING BRAKE

Renato Riboldi, Albiate, Italy, assignor to Officine Meccaniche Mario Riboldi S.N.C. di Renato, Carlo Riboldi & C., Albiate, Italy

Filed Mar. 19, 1981, Ser. No. 245,711
Claims priority, application Italy, Mar. 21, 1980, 20828 A/80
Int. Cl.³ B21D *7/06*
U.S. Cl. 72—389 **11 Claims**



1. In a bending brake comprising a pair of complementary elongate sheet-deforming tools, a fixed bed carrying one of said tools in a substantially horizontal position, a vertically movable carrier for the other of said tools, support means rising from said bed, a pair of hydraulic cylinders symmetrically mounted on said support means above opposite extremities of said carrier, said cylinders being provided with vertically reciprocable pistons rigidly secured to opposite ends of said carrier for holding same substantially horizontally above said one of said tools, a source of hydraulic fluid, and flow-control means for simultaneously directing hydraulic fluid from said source to corresponding ports of said cylinders to reciprocate said pistons and said carrier between a top position and a bottom position with resulting deformation of a workpiece of sheet material inserted between said tools,

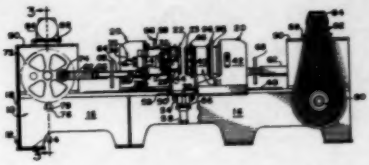
the improvement wherein said flow-control means comprises a pair of shut-off valves mounted on said bed adjacent said extremities in respective flow paths leading from said source to the corresponding cylinders, a pair of reversing valves in said flow paths jointly controlled by said shut-off valves for initiating a rising motion of both pistons only upon arrival of both shut-off valves in the closed position thereof, and a pair of actuators in line with said shut-off valves on said carrier for operating each shut-off valve to cut off the supply of hydraulic fluid to the corresponding cylinder upon arrival of the respective piston in a predetermined position of closest approach to said bed, said shut-off valves being normally biased into an open position and being mechanically displaceable by said actuators into a closed position.

4,389,875

METHOD AND APPARATUS FOR MAKING BEADS ON DRUMS

Carl C. Grotnes, II, Roswell, Ga., assignor to Atlanta Grotnes Machine Company, Atlanta, Ga.

Filed Dec. 29, 1980, Ser. No. 220,708
Int. Cl.³ B21D *17/02, 15/06*
U.S. Cl. 72—393 **28 Claims**



1. In a machine for forming a bead on a drum:

a machine frame,

opposed heads mounted for movement on said machine frame toward and away from each other,

bead forming means on each of said heads for movement thereon to engage the interior of a drum and to form a bead circumferentially thereon,

said bead forming means being independently operable on each of said heads to engage said drum to form a bead thereon,

crank means on each of said heads for driving said respective head in and out of said drum, said crank means being actuated independently of said bead forming means,

drive means for said crank means, said drive means and said crank means being operated independently of said bead forming means whereby said crank means drives said heads in a smooth motion independently of said bead forming means,

bead forming drive means independent of said drive means for said crank means,

brake means for stopping said crank means and said drive means for said crank means to cause said heads to pause inside said drums,

means for timing said crank means and said crank drive means to synchronize with said bead forming means so that said opposed heads pause inside said drum while said bead forming means form beads during which said bead forming means is operated independently of said crank means and crank drive means whereby said bead forming means is not driven by or from said crank drive means or said crank means.

4,389,876

TEMPERATURE SENSOR AND DETECTOR CELL UTILIZING THE SAME

Eugene L. Szoantagh, Flourtown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 26, 1980, Ser. No. 181,488
Int. Cl.³ G01N *31/00*; G01F *1/68*; H01C *7/10*
U.S. Cl. 73—27 R **6 Claims**

1. A temperature detector cell comprising

an electrically insulating and thermally insulating substrate,

a thermistor element means deposited on said substrate,

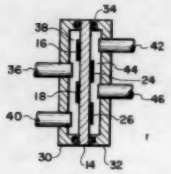
a first electrical connector means deposited on said substrate and connected to one end of said element means,

a second electrical connector means deposited on said substrate, and connected to the other end of said element means,

cell housing means enclosing said thermistor element means within a volume defined by said housing means,

electrical connection means connected to said first and second electrical connector means and extending out from said housing means and

fluid passage means in said housing means for providing a fluid passage to said volume through said housing means, wherein said substrate is arranged to divide said volume into a first fluid flow path, and a second fluid flow path which is fluid isolated from said first fluid flow path and said thermistor element means includes a first thermistor element deposited on a first side of said substrate and a second thermistor element deposited on a second side of said substrate whereby said first and second thermistor elements are exposed to



respective ones of said first and second fluid flow paths and said first electrical connector means including a first electrical connector connected to one end of said first thermistor element and a second electrical connector connected to one end of said second thermistor and said second electrical connector means including a third electrical connector connected to the other end of said first thermistor element and a fourth electrical connector connected to the other end of said second thermistor element and said fluid passage means including a first fluid inlet and a first outlet for admitting a fluid to said first fluid flow path and a second fluid inlet and a second fluid outlet for admitting a fluid to said second fluid flow path.

4,389,877

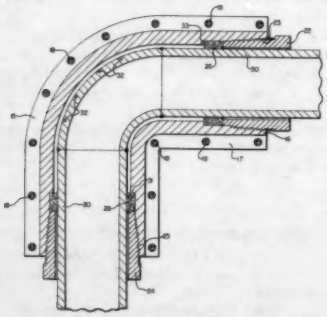
PIPING EROSION MONITORING SYSTEM

Walter J. Lacey, P.O. Box 59, Patterson, La. 70392

Filed Mar. 27, 1981, Ser. No. 248,552

Int. Cl.³ G01N *17/00*; G01M *3/02*

U.S. Cl. 73—37 **10 Claims**



1. A system for monitoring reduction in wall thickness in piping due to erosion or corrosion, which system comprises:

a. at least one point of reduced strength in said pipe in the area anticipated to undergo the highest rate of reduction in wall thickness;

b. hollow casing means encircling at least a portion of said pipe and positioned to overlie and encompass said point, said hollow casing means having its inside wall spaced outwardly from the outside pipe wall at least at said point;

c. sealing means for achieving a fluid seal between said pipe casing, said sealing means providing a fluid seal zone encompassing said point; and

d. an aperture through said hollow casing extending to said zone and having conduit means attached thereto for communicating fluid pressure changes in said zone to a sensory means in fluid pressure communication with said aperture, wherein said point of reduced strength is a notch formed into the outside wall of said pipe to a preselected depth whereby the remaining pipe wall thickness at the site of said notch is sufficient to contain the fluid pressure in said pipe until a predetermined amount of said pipe wall at said notch has been reduced in thickness by erosion or corrosion.

4,389,878

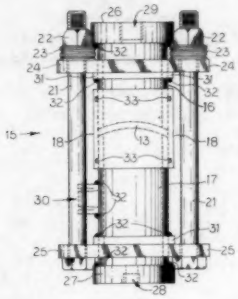
DYNAMIC GAS TRANSMISSION MEASURING APPARATUS

Otter L. Manzie, Jr., Saginaw, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 1, 1981, Ser. No. 259,768

Int. Cl.³ G01N *15/08*

U.S. Cl. 73—38 **4 Claims**



1. Dynamic technique for determining the rate of transmission of a given gas (including vapor(s)) by and through a sample of a given plastic material whose gas permeation characteristic is being measured which comprises, as Steps of the technique:

(I) taking a sample of given plan-view surface area subject to facially-transgressing permeation thereacross by the given gas of a given plastic material whose gas permeation rate characteristic is being determined;

(II) mounting said sample in a confined and retained manner in such a way that it can be exposed within controlling confines to gas under a given maximum test pressure to be applied against the upstream side of the sample to be thereby and thereto exposed with a reduced or zero gas pressure effective on the opposing, downstream side face; then,

(III) at constant given temperature, constantly applying for a given time period involved and utilized in the test the gas at said maximum pressure against the exposed upstream face of said sample;

(IV) permitting the gas during said test time period to permeate and transgress said sample;

(V) measuring continuously or from time-to-time within said test time period the dynamically changing pressure drop from upstream to downstream side faces of and across said sample undergoing test;

(VI) Noting and collecting the critical involved time(s), temperature(s) and pressure(s) data gatherable from the system, and finally

(VII) calculating from the collected data the particularly-involved gas transmission rate of and for said plastic material, including the step of taking a generally circular, rela-

tively dish-shaped and curvilinear sample from plastic tubing for the sample involved in said Steps (I) and (II).

4,389,879

METHOD AND APPARATUS FOR DETERMINING THE COLLOID INDEX IN LIQUIDS

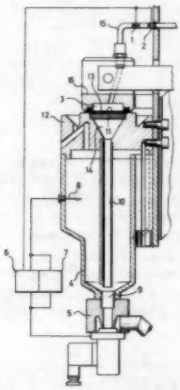
Dieter Bach, Lilienweg 43, D-7014 Kornwestheim; Heiner G. Jäckle, Rotenwaldstrasse 179, D-7000 Stuttgart, and Kurt Marquardt, Eschelbacher Weg 33, D-7031 Holzgerlingen, all of Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,035

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009130

Int. Cl.³ G01N *15/00*

U.S. Cl. 73—61 R 9 Claims



1. Apparatus for determining the colloid index of a liquid, comprising: conduit means for supplying measuring liquid from a body of liquid for the purposes of performing a colloid measuring operation on said measuring liquid; a measuring filter for filtering the measuring liquid supplied by the conduit means; below the measuring filter, a collecting and measuring container for collecting liquid which is passed through the filter; above the measuring filter a pressure means including a pressure chamber for pressing measuring liquid through the filter; an inlet valve on said conduit means for controlling the flow of measuring liquid into the pressure chamber; an outlet valve at the outlet of the container, for controlling the discharge of measuring liquid therefrom; means for measuring the volume of liquid in the container; and a time control means operable to control the opening and closing of the inlet and outlet valves and adapted to open the inlet valve and close the outlet valve to cause measuring liquid to flow through the measuring filter and be collected in said container, and adapted to open the outlet valve after measuring liquid has passed into said container for a given period of time and to hold the outlet valve open for a test period, and the time control means being further adapted to close the outlet valve for a given period of time after expiry of the test period, and to close the inlet valve after the expiry of said given period of time for which the outlet valve is closed.

4,389,880

RAPIDLY ERODIBLE SONDE

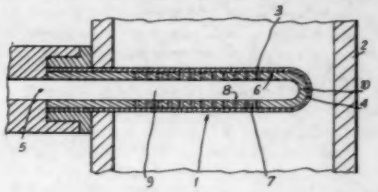
Alain Robinet, Muret, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Apr. 21, 1981, Ser. No. 256,236

Claims priority, application France, Apr. 21, 1980, 80 08882

Int. Cl.³ G01L *19/12;* G01N *15/07*

U.S. Cl. 73—86 3 Claims



1. A device for rapidly detecting the intrusion of sand in fluid conveyed in a pipeline under pressure, said device comprising, a tubular sonde comprised of a closed outer end and an inner end in fluid communication with the interior of the outer end, said outer end comprising an envelope of thin metal foil, means for mounting said sonde with said inner end outside said pipeline and with said envelope within the pipeline in the path of fluids flowing through the pipeline and exposed to the pressure in the pipeline, duct means for connecting the interior of the sonde to detecting means for detecting a pressure variation in the interior of the sonde, a support within said outer end in contact with and supporting said envelope to prevent collapse of the thin metal of the envelope as a result of pressure in the pipeline, said support having a plurality of discontinuities therein between the envelope and the interior of the sonde, said envelope of thin metal foil normally isolating the interior of the sonde from the pressure in the pipeline, but being rapidly erodable by sand entrained in the fluids flowing through the pipeline, so that the envelope is rapidly erodable upon intrusion of sand in fluid flowing through the pipeline, and the resulting pressure increase from the pipeline to the interior of the sonde, through the discontinuities of the support, is sensed by the detecting means to thereby rapidly detect the intrusion of sand.

4,389,881

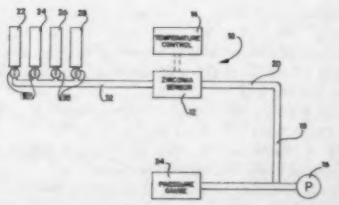
METHOD OF MEASURING AN AIR TO FUEL RATIO

James W. Butler, Dearborn Heights, and Alex D. Colvin, Oak Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1981, Ser. No. 288,874

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 7 Claims



1. A method of measuring the air to fuel ratio of an air/fuel mixture being supplied to a combustion process which comprises the steps of:

establishing an oxygen sensor station at which said sensor senses the difference in oxygen partial pressure from a first

reference side thereof to a second oxygen measurement side thereof;

maintaining said oxygen sensor at a predetermined temperature and a predetermined pressure below atmospheric pressure;

calibrating said oxygen sensor so that the measurement thereby of an EMF between said first reference side thereof and said second oxygen measurement side thereof is indicative of the oxygen partial pressure in a gas stream passing by said oxygen measurement side thereof;

drawing at said predetermined pressure, a sample gas stream across said oxygen measurement side of said oxygen sensor, said predetermined pressure being one which allows said sample gas stream to be drawn at a constant flow rate independent of that predetermined pressure;

adding a fixed amount of oxygen to said sample gas stream;

reacting said oxygen in said sample gas stream with oxidizable species contained in said sample gas stream prior to passing said sample gas stream across said second oxygen measuring side of said oxygen sensor;

measuring said predetermined pressure; and

determining the air to fuel ratio of the air/fuel mixture from the EMF measured by said oxygen sensor, the predetermined pressure of said sample gas stream and the known oxygen addition rate.

4,389,882

METHOD AND APPARATUS FOR DETERMINING AN ABNORMALITY IN A VALVE ACTUATING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

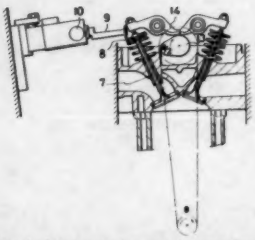
Shuhei Noro, Aichi, and Tadashi Naito, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 19, 1981, Ser. No. 265,071

Claims priority, application Japan, Jun. 5, 1980, 55-75846

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **7 Claims**



1. A method of determining an abnormality in a valve actuating system of an internal combustion engine, said method comprising the steps of

measuring a valve lift of a correctly assemblied reference engine at at least two crank angles;

memorizing the relationship between each measured valve lift and crank angle in an arithmatic unit;

thereafter indexing a crank shaft of an engine having a valve actuating system to be checked at said crank angles and measuring the valve lifts at said crank angles of said crank shaft; and

delivering the values of the measured valve lifts of the system to be checked to said arithmetic unit to determine any abnormality in said system to be checked.

4,389,883

METHOD OF AND ARRANGEMENT FOR DETERMINING THE AXIAL PLAY BETWEEN THE STATOR AND THE ROTOR OF AN ELECTRIC MOTOR

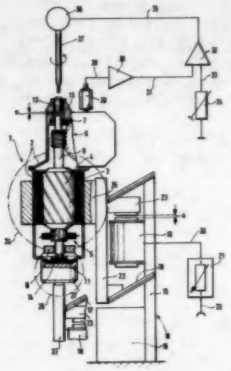
Manfred Köder, Gerlingen, and Günther Schmid, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,165

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044417

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 R **25 Claims**



1. A method of determining the extent of axial play between the rotor and two axially spaced axial bearings mounted on the stator of an electric motor, especially of a small-size electric motor, comprising the steps of applying to the electric motor forces of such orientation and duration that the rotor conducts axial movement relative to the stator and abuts at least one of the bearings with an impact force indicative of the extent of the axial play; and sensing the magnitude of the impact force for use in determining the extent of the axial play.

4,389,884

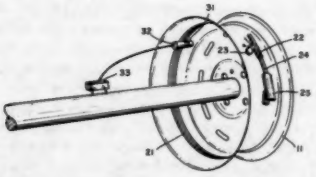
REMOTE TIRE PRESSURE INDICATOR

Gianluigi Agulia, 30, Viale Japigia, 73100, Lecce, Italy

Filed Jun. 15, 1981, Ser. No. 273,348

Int. Cl.³ B60C *23/02*

U.S. Cl. 73—146.5 **1 Claim**



1. A remote system for indicating tire pressure for use in combination with a pressure transducer which is disposed inside a pneumatic tire where the tire is mounted on a wheel rim, said remote system comprising:

a. a ferrite rod which is mechanically coupled to the pressure transducer and which is disposed within the pneumatic tire;

b. a passive circuit including a first coil which is mechanically coupled to the wheel rim, a second coil which is electromagnetically coupled to said ferrite rod which is slidably coupled to said second coil and a capacitor, all of

which are electrically coupled in series to form a tuned circuit which resonates at a particular frequency which is dependent on the position of the ferrite rod;

c. an oscillating circuit having a third coil of several turns on a rod of highly permeable material which is disposed adjacent to said first coil of said passive circuit on said wheel rim whereby said passive circuit receives energy from said oscillating circuit and the linear movement of said ferrite rod produces a change in the frequency at which said passive circuit resonates thereby producing a voltage across said third coil of said oscillating circuit which is linearly proportional to the change of pressure in the pneumatic tire;

d. amplifying means for amplifying the voltage which is electrically coupled to said oscillating circuit; and

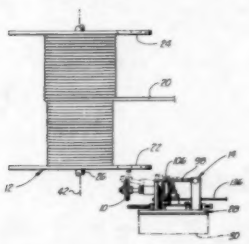
e. displaying means for displaying the amplified voltage which is electrically coupled to said amplifying means.

4,389,885

SIGNAL GENERATOR FOR A PENETRATION RATE MEASURING APPARATUS

T. Edward Martin, Oklahoma City, Okla., assignor to Arthur J. Connelly, Farmington, N. Mex.

Filed Mar. 30, 1981, Ser. No. 248,957
Int. Cl.³ E21B 45/00
U.S. Cl. 73—151.5 **11 Claims**



1. An apparatus for generating depth indicator signals indicative of the depth of penetration of a drill string which is lowered by a cable wound on a drum, comprising:

a friction wheel positioned adjacent one side of the drum and engageable therewith so as to be turned by the drum as the drum is turned to lower the drill string;

means for selectively engaging the friction wheel with the side of the drum;

signal production means, connected to the friction wheel, for producing a depth indicator signal each time the friction wheel is turned through a preselected angle of rotation; and

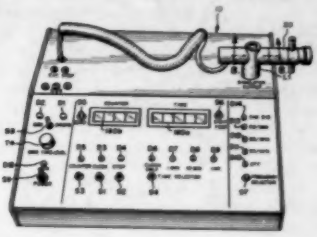
shift means, supporting the friction wheel for movement substantially radially of the drum and connected to the signal production means so as to receive the depth indicator signals produced thereby, for cyclically shifting the friction wheel a preselected distance toward the axis of the drum in response to reception by the shift means of a preselected first number of depth indicator signals and shifting the friction wheel an equal distance away from the axis of the drum in response to reception by the shift means of an additional preselected second number of depth indicator signals.

4,389,886

CALIBRATING UNIT

Roman L. Korczak, Des Plaines, Ill., assignor to Lutheran General Hospital, Inc., Park Ridge, Ill.

Filed Mar. 2, 1981, Ser. No. 239,338
Int. Cl.³ G01M 19/00
U.S. Cl. 73—168 **12 Claims**



1. An automatic calibrating unit comprising:

sensor means for generating a train of pulses in response to the passage of a series of drops of a fluid;

counter means, responsive to the train of pulses, for maintaining a count representative of the total number of drops passing the sensor means during a counting interval such that the counting means automatically stops the count at the end of the counting interval;

means for manually designating a selected one of a plurality of measurement intervals, said plurality of measurement intervals including a first predetermined measurement interval which is at least ten times longer in duration than a second predetermined measurement interval;

means for setting the counting interval to correspond to the selected one of the plurality of measurement intervals; and

means for displaying the count;

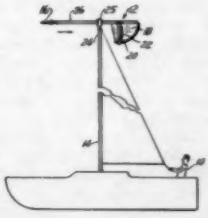
said automatic calibrating unit operating automatically to count and then to display and hold the number of drops detected by the sensor means during the counting interval.

4,389,887

WIND VELOCITY GAGE FOR SAILBOATS

John L. Howlett, 1717 Ashtan, Walled Lake, Mich. 48088

Filed Jun. 8, 1981, Ser. No. 271,639
Int. Cl.³ G01F 1/28; G01W 1/02
U.S. Cl. 73—189 **8 Claims**



1. A wind velocity gage for a sailboat, comprising:

a vertical shaft mounted on the upper end of the sailboat mast;

a horizontal shaft pivotally mounted at the upper end of said vertical shaft, said horizontal shaft having a weight adjustment means at its forward end and a vertical arcuately formed fin at its rearward end;

a wind velocity pointer pivotally mounted on said fin and having a pair of vertical side fins; and

a visual readout sector peripherally formed on an extended

edge of said fin arcuate surface and having a downwardly facing indicating surface for providing a wind velocity indication responsive to the pivotal movement of said pointer.

4,389,888

LEVEL METER

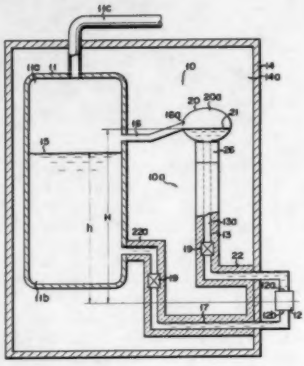
Shinichi Morooka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 12, 1980, Ser. No. 215,661

Claims priority, application Japan, Dec. 21, 1979, 54-165499; Dec. 6, 1980, 55-12445

Int. Cl.³ G01F *23/14*

U.S. Cl. 73—299 **1 Claim**



1. A level meter comprising:

a container having water at its lower portion and steam at its upper portion;

a reference chamber containing water at a level higher than the water level inside said container and containing steam over said water;

a differential pressure detector having two pressure inlet ports and disposed in a position below the water level inside said container, whereby the difference between two pressures separately applied to said pressure inlet ports is detected;

a vertical pipe connecting the bottom end of said chamber with one of said pressure inlet ports of said differential pressure detector and being filled with water;

a lower pipe connecting the water containing portion of said container with the other pressure inlet port of said differential pressure detector and being filled with water;

an upper pipe connecting the steam containing portion of said container with the steam containing portion of said chamber, thereby maintaining the surface of the water in said chamber at a fixed high-level position relative to said differential pressure detector and maintaining the respective steam containing portions of said container and said reference chamber at the same pressure; and

an adiabatic jacket covering the periphery of said vertical pipe, except for an exposed portion of a predetermined length which extends from said reference chamber, whereby the heat transmission between the outer periphery and the interior of said vertical pipe caused by the temperature difference therebetween is inhibited,

so that an increase of the temperature of water inside said vertical pipe which may cause an error in measurement of the level of the water in the container, as well as boiling of said water, can be retarded even when the temperature at the outer periphery of said vertical pipe is increased suddenly, further comprising a cooler attached to said exposed portion of the vertical pipe between said adiabatic jacket and said reference chamber for cooling said portion.

4,389,889

APPARATUS FOR DETECTING THE PRESENCE OF WATER IN A FUEL TANK

Roger G. Larson, 911 Laguna Rd., Fullerton, Calif. 92635

Filed Mar. 2, 1981, Ser. No. 239,658

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **12 Claims**

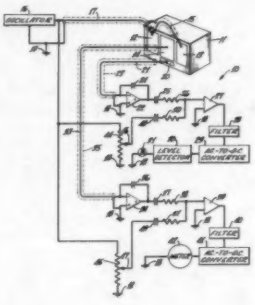
1. Apparatus for determining the fuel level in a fuel tank and for detecting the presence of water in the fuel tank before such water can effect the accuracy of the fuel level determination comprising:

means for generating a first AC signal;

a first electrode coupled to said first AC signal generating means and operatively positioned relative to said fuel tank for coupling said first AC signal into a fluid in said fuel tank;

a second electrode positioned in parallel, horizontally-spaced relationship to said first electrode whereby the capacitance between said first and second electrodes increases as the fuel level in said tank increases;

circuit means coupled to said second electrode and responsive to the change in capacitance between said first and



second electrodes for providing a second signal indicative of the fuel level in said tank;

a third electrode operatively positioned adjacent the bottom of said tank and positioned to sense the presence of water therein;

means coupled to said third electrode for providing a third signal, a characteristic of which is proportional to the amount of electrical signal coupled between said first and third electrodes; and

means responsive to said third signal for indicating the presence of water in said tank when said characteristic of said third signal exceeds a predetermined value.

4,389,890

PRESSURE REGULATOR ASSEMBLY GUARD

Stephen M. Bolick, 2417 Windbreak Dr., Alexandria, Va. 22306, and John O. Vought, 9256 Sprucewood Rd., Burke, Va. 22015

Filed Apr. 24, 1981, Ser. No. 257,451

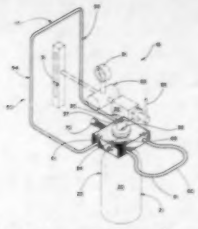
Int. Cl.³ G01D *11/24*

U.S. Cl. 73—431 **5 Claims**

1. A guage guard for use with a pressure regulating assembly, including pressure regulating valves, regulator guages and a plurality of fluid couplings operatively connecting the regulator assembly to a source of pressurized gas; where the source of pressurized gas is an elongated cylinder, having a cylindrical throat member into which one of the plurality of fluid couplings is inserted, the guard comprising;

an apertured collar comprising a plate having an enlarged centrally disposed aperture dimensioned to receive a portion of the cylinder, and having a handle member rigidly secured thereto;

a rigid framework, secured to the apertured collar, which is spaced from, and projects below, beyond and above the regulator assembly, and is dimensioned to extend beyond the regulator assembly in the vertical and horizontal planes, and comprises a rod formed into the shape of a



loop having two legs, which are disposed parallel to one another over a major portion of their combined length, and

locking means for attaching the apertured collar and the framework to a portion of the cylinder.

4,389,891

SYSTEM FOR MEASURING RESONANCE FREQUENCIES IN TURBINE AND COMPRESSOR VANES AND PROPELLER BLADES

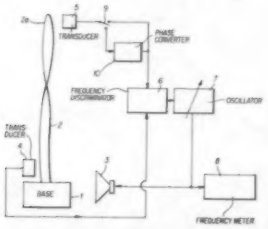
Jacques M. A. Fournier, Chatillon, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Jun. 24, 1981, Ser. No. 277,030

Claims priority, application France, Jun. 24, 1980, 80 13935

Int. Cl.³ G01H *13/00, 1/00*; G01D *1/00*

U.S. Cl. 73—579 **8 Claims**



1. A system for measuring resonance frequencies in at least one rotatable blade rigidly attached at a base thereof to a base, comprising:

an excitor for generating sound waves in the vicinity of said blade;

at least one acoustic transducer placed in the vicinity of the base of said blade for generating a phase signal, the phase of which can be used as a blade excitation reference;

a displacement transducer placed in the vicinity of the tip of said blade for generating a second signal based on blade tip displacement;

a phase discriminator which receives the signals from said at least one acoustic transducer and said displacement transducer and produces an error signal based on the phase difference therebetween;

an oscillator coupled to the discriminator for producing a variable frequency output in dependence on said error signal, said variable frequency output applied to said excitor; and

a frequency meter coupled to the variable frequency output of said oscillator for measuring the oscillator frequency when the system has reached equilibrium.

4,389,892

REVERBERATION CHARACTERISTICS MEASURING DEVICE

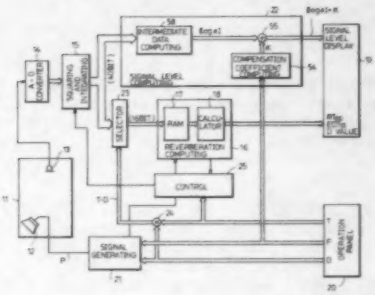
Koji Niimi, and Fukushi Kawakami, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 20, 1981, Ser. No. 255,806

Claims priority, application Japan, Apr. 30, 1980, 55-56169; Apr. 30, 1980, 55-56170

Int. Cl.³ G01H *7/00*

U.S. Cl. 73—586 **4 Claims**



1. A reverberation characteristics measuring device comprising:

a signal generating circuit for generating a signal for a test sound;

first setting means for setting a duration of said test sound;

means for converting a reverberation signal produced by sounding of said test sound to a digital signal;

a squaring and integrating circuit for squaring and integrating said digital reverberation signal;

second setting means for setting an integration time of said squaring and integrating circuit;

a selector for selecting out a partial section of the entire output data of said squaring and integrating circuit;

selector control means coupled to said first and second setting means for determining said partial section of the entire output data to be selected by said selector;

a reverberation characteristics computing circuit for computing reverberation characteristics on the basis of the output of said selector; and

a display unit for displaying the reverberation characteristics computed by said computing circuit.

4,389,893

PRECISION ULTRASOUND ATTENUATION MEASUREMENT

Jonathan Ophir, and Nabil F. Maklad, both of Houston, Tex., assignors to North American Philips Corporation, Tarrytown, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,882

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—599 **12 Claims**

1. A method of measuring an attenuation characteristic in a region of interest comprising:

introducing pulses of ultrasound energy into the region;

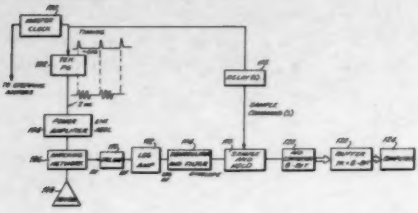
detecting narrow-band signals which represent the amplitude of echoes of said pulses which are reflected from different depths along a plurality of propagation paths within said region;

accumulating a first statistically independent set of said signals which represent echoes from a first surface in said region;

accumulating a second statistically independent set of said signals which represent echoes from a second surface in said

region which is spaced at a determined distance, along said paths, from said first surface; and

calculating an attenuation characteristic in said region as the



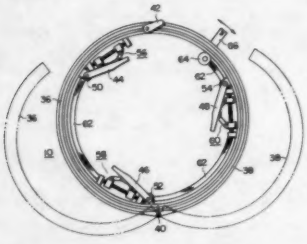
difference between (1) a central tendency parameter of the logarithms of the signals in said first set and (2) the same central tendency parameter of the logarithms of the signals in the second set.

4,389,894

CYLINDRICAL GUIDE RAIL FOR DETECTOR

Shigeru Kajiyama, Hitachi, Japan, assignor to Hitachi Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,841
Claims priority, application Japan, Jan. 30, 1980, 55-8819
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—637 **10 Claims**



1. A cylindrical guide rail for a detector having; a split cylindrical ring, each half ring being hinged together, guide means provided circumferencially around said split ring, along which the detector being driven, a plurality of clamp shoes arranged around the inner surface of said split ring for securing said split ring in the closed position coaxially around a cylindrical object to be inspected, adjusting means for adjusting positions of said clamp shoes toward and away from the cylindrical object to be inspected, wherein the improvement comprising; jack means secured to the inner surface of said split ring and supporting said clamp shoes for adjusting the positions of said clamp shoes, force transmitting means provided circumferentially around the split ring for transmitting a force to each of said jack means, thereby the force applied is transmitted to said respective jack means and converted into a force to adjust the positions of said respective clamp shoes.

4,389,895

CAPACITANCE PRESSURE SENSOR

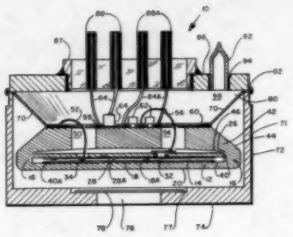
Stanley E. Rud, Jr., Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jul. 27, 1981, Ser. No. 287,307
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—724 **19 Claims**

1. Apparatus for measuring pressure comprising:

diaphragm means for deflection under pressure having a first side for application of first pressure thereto, and a second side for application of a second pressure, wherein at least a portion of the diaphragm means is conductive thus forming a first capacitor electrode;

reference disc means having a passageway therethrough for communicating the first pressure to one side of the diaphragm means and having a first disc side and a second disc side, wherein at least a portion of the reference disc means is conductive thus forming a reference capacitor electrode in electrical communication with the first capacitor electrode, and



spacer means for supporting the diaphragm means adjacent its edges in a spaced relationship from the reference disc means,

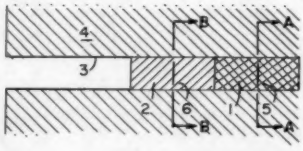
characterized in that the spacer means is formed from substantially the same material as the diaphragm means and the reference disc means and is disposed therebetween, and wherein the diaphragm means, the reference disc means and the spacer means are then fused together.

4,389,896

BOREHOLE GAUGE FOR IN-SITU MEASUREMENT OF STRESS AND OTHER PHYSICAL PROPERTIES

Clarence O. Babcock, Lakewood, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 27, 1981, Ser. No. 267,506
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—784 **4 Claims**



1. A method for obtaining in-situ data useful in deriving the unknown state of stress and the two unknown physical constants Young's modulus and Poisson's ratio for a solid elastic mass from a length of hole previously drilled into the mass comprising the steps of:

a. placing in said drill hole, a first inclusion with known physical properties and a measuring means which can provide data from which the principal strains in said first inclusion can be derived, and

b. placing in said drill hole, a second inclusion with known but different physical properties than said first inclusion and a measuring means which can provide data from which the principal strains in said second inclusion can be derived, and

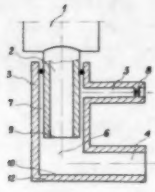
c. processing the data derived from said first and second measuring means in each inclusion to arrive at the state of stress and the physical constants for the elastic solids.

4,389,897

IMPELLER FLOW-METER PULSATION DAMPING

Stanislaw Kolodziejski; Stanislaw Dwojak, and Andrzej Grabowski, all of Warsaw, Poland, assignors to Przemyslowy Instytut Automatyki i Pomiarow "MERA-PIAP", Warsaw, Poland

Filed Apr. 8, 1981, Ser. No. 252,227
Claims priority, application Poland, Apr. 16, 1980, 223527
Int. Cl.³ G01F 1/00
U.S. Cl. 73—861 9 Claims



1. In an impeller flow-meter for measuring the flow rate of a liquid impelled therethrough, including an impeller chamber for a rotary impeller, a supply pipe for the liquid and an inlet pipe to said chamber, and an offtake pipe for removing excess liquid not impelled through the meter, the flow rate of the liquid being determined by the rotational rate of the impeller, the improvement which comprises, particularly for accurately measuring the flow rate of liquid fuel in an internal combustion engine, incorporating in said flow-meter the following features:

(a) an ante-chamber (3) is provided connected to said supply pipe (4) and to said offtake pipe (5);

(b) said ante-chamber (3) has an upper portion thereof mounted externally of an coaxially with the inlet pipe (2) to provide an annular slot (7) therebetween, permitting passage of liquid between the outer wall of the inlet pipe (2) and the inner wall of the ante-chamber (3);

(c) said offtake pipe (5) is in communication with said slot (7); and

(d) said supply pipe (4) is in communication with a space (6) within said ante-chamber (3) below said upper portion;

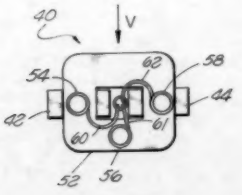
whereby pulsations in the liquid supply from the supply pipe (4), which would affect the rotational rate of the impeller, are damped and extinguished before the liquid reaches the impeller chamber (1) through the inlet pipe (2).

4,389,898

ELECTROMAGNETIC VELOCITY TRANSDUCER

James C. Long, 1965 8th St. #2, Los Osos, Calif. 93402, and James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93401

Filed Dec. 4, 1980, Ser. No. 213,128
Int. Cl.³ G01F 1/58
U.S. Cl. 73—861.12 4 Claims



1. A transducer for generating an electrical signal that is a function of the velocity of a flowing body of liquid having a surface comprising:

(a) a submergible body having an upper surface and a lower surface;

(b) means located within the submergible body for imposing a magnetic field transverse to the direction of flow of the liquid, said means comprising:

(1) a ferromagnetic core including two coplanar U-shaped members substantially transverse to the direction of flow and separated by a preselected distance, the U-shaped members being arranged with respect to the body so that the resultant vector of the radiated field is directed from the upper surface of the body toward the surface of the body of liquid; and

(2) A coil surrounding the inner legs of the U-shaped members and wound upon a bobbin of electrically insulative material;

(c) A pair of measuring electrodes lying along a line substantially coincident with the direction of the cross product of said magnetic field vector and said velocity;

(d) a circuit for deriving an electrical signal representing the potential difference between said measuring electrodes, whereby said electrical signal is a function of the average velocity of flow over said preselected distance; and

(e) means for conducting the electrical potential of each of said measuring electrodes to said circuit, said conducting means comprising:

(1) a first wire providing electrical connection between one of said measuring electrodes and said circuit;

(2) a second wire providing electrical connection between the other of said measuring electrodes and said circuit;

(3) said bobbin having an upper surface and a lower surface; and

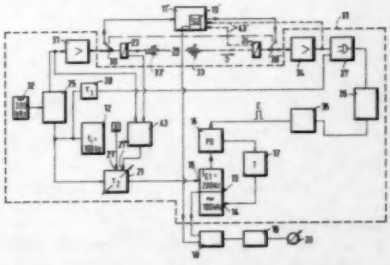
(4) portions of said first wire and of said second wire forming in combination a generally s-shaped geometry at the upper surface of said bobbin whereby oppositely directed cancelling currents are induced at a no-flow condition.

4,389,899

APPARATUS FOR MEASURING THE SPEED OF FLOW OF FLOWABLE MEDIA

Gerhard Krause, 26c Wachtelweg, 8200 Rosenheim, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,166
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943810
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 14 Claims



1. Apparatus for measuring the speed of flow of flowable media by determining the transit time of sound waves therein, in which first and second transmitter-receivers in the form of electroacoustic converters are spaced apart in the direction of flow with an imaginary line joining said first and second transmitter-receivers having at least a component in the direction of the flow to be measured and in which sound pulses are sent alternately in a first direction from said first transmitter-receiver to said second transmitter-receiver and in a second direction, opposite to said first direction, from said second

transmitter-receiver to said first transmitter-receiver, there being a processing circuit for determining the speed of flow from the transit times of the sound pulses in the first and second directions, the apparatus further comprising pulse circuits which for said first and second directions have available:

(a) a pulse generator operating at a first specific frequency and connected to the associated electroacoustic converter;

(b) a frequency generator which preferably operates at a higher frequency, said frequency generator having a frequency control input and a setting or trigger input to which pulses of the pulse generator are applied, and

(c) a phase detector having first and second inputs to which received pulse signals and the output of the frequency generator are respectively applied with the output of said phase detector being passed to a mean value forming stage which is in turn connected to the frequency control input of the frequency generator and which regulates the frequency of the frequency generator to a value corresponding to the time interval between the arrival of a pulse at the setting input and the arrival of the received pulse signal at the phase detector,

and means for passing the frequencies of the frequency generators to the processing circuit.

4,389,900

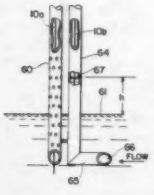
CAPACITANCE PROBE SENSOR DEVICE

Manuel Gutierrez, Golden, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 481,408, Jun. 14, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,705

Int. Cl.³ G01F *1/34, 1/00*

U.S. Cl. 73—861.42 **3 Claims**



1. Two capacitive probes used to determine the rate of flow of a liquid comprising:

a first capacitive probe having a metallic tube with perforations to permit the passage of a liquid therethrough and a wire electrode mounted in said tube to determine the vertical level of the liquid whose rate of flow is to be determined;

a second capacitive probe attached to said first probe, said second probe having a metallic liquid retaining tube with a bent section and an open end which faces the incoming flow of the liquid, said second probe also having a wire electrode, said second probe's metallic tube permitting the liquid to reach a height therein directly related to flow rate of the liquid being measured; and

means for determining the difference in the vertical displacement of the liquids in said two probes by measuring the respective capacitance levels of the probes whereby the rate of flow of the liquid can be determined by ascertaining said difference.

4,389,901

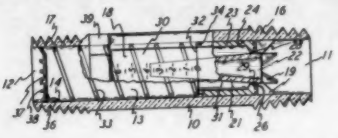
FLUID FLOW METER

Jack E. Lake, Racine, Wis., assignor to Racine Federated Inc., Racine, Wis.

Filed May 14, 1981, Ser. No. 263,680

Int. Cl.³ G01F *1/22*

U.S. Cl. 73—861.58 **12 Claims**



1. In a fluid flow meter comprising a housing of a transparent material and having a fluid inlet and a fluid outlet and having a cylindrical wall defining a hollow interior, a conical member secured on the interior of said housing, a piston movably disposed in said housing and slidable along said cylindrical wall of said housing and having a central opening piloted on said conical member for movement of said piston in accordance with the rate of flow of fluid through said housing and toward said outlet, a spring for urging said piston toward said inlet, a scale on said housing and matched with said piston for indicating the rate of flow of fluid, the improvement comprising a plurality of fins extending between said housing and said conical member adjacent said fluid inlet and in the path of the flow of fluid into said housing and toward said piston, to direct the fluid to flow in a laminar flow pattern as contrasted to a turbulent flow pattern and to direct the laminar flow onto said piston and thereby create steady flow-sensing positions for said piston.

4,389,902

FLOW RATE TRANSDUCER

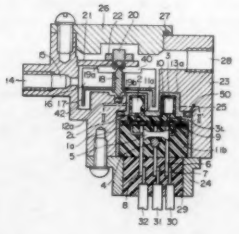
Masami Kataoka, Kariya, and Nobumasa Higo, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 23, 1981, Ser. No. 256,831

Claims priority, application Japan, Apr. 25, 1980, 55-55739

Int. Cl.³ G01F *1/075, 15/06*

U.S. Cl. 73—861.77 **21 Claims**



1. A flow rate transducer for producing an electrical signal indicative of flow rate of fluid, comprising:

(a) a housing defining a fluid chamber which communicates with an inlet passage and with an outlet passage;

(b) a blade wheel rotatably mounted in said fluid chamber, and having a plurality of light-shielding plates;

(c) a light-emitting element arranged at one side of a given point of the locus of said light-shielding plates;

(d) a light-receiving element arranged adjacent to said light-emitting element;

(e) means for reflecting a light beam from said light-emitting element so that the reflected light beam is received by said light-receiving element;

(f) means for carrying said light-emitting element, said light-receiving element and the reflecting means thereon; and

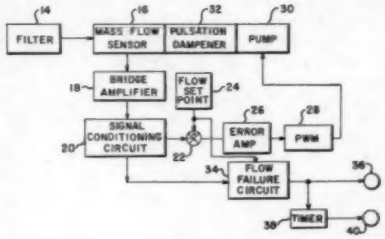
(g) a casing having two recessed portions for respectively receiving, in the first recessed portion, said light-emitting element and said light-receiving element, and in the second recessed portion, said reflecting means, each of said recessed portions having a transparent portion so that light transmission from said light-emitting element via said reflecting means to said light-receiving element is effected therethrough, said casing being fixedly connected to the carrying means, and being embedded in a bore made in said housing.

4,389,903

INDICATING SYSTEM FOR ATMOSPHERIC PUMP ARRANGEMENT

Gregory A. Bertone, and Clayton J. Bossart, both of Monroeville, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 4, 1981, Ser. No. 260,374
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—863.03 **8 Claims**



1. In an atmospheric sampling pump arrangement, the combination of a mass flow sensor for producing an output signal proportional to mass airflow of atmospheric air, means for comparing said output signal with a set-point voltage to produce a signal voltage when mass airflow drops below a predetermined limit, means for indicating the existence of said signal voltage, a counter, means for enabling said counter to count up when said signal voltage exists, and second indicating means which is actuated when said counter counts up to a predetermined value.

4,389,904

METHOD AND APPARATUS FOR SUPERCOOLING AND SOLIDIFYING SUBSTANCES

Lewis L. Lacy; Michael B. Robinson; Thomas J. Rathz; Lester Katz, all of Huntsville, Ala., and Daniel B. Nisen, Memphis, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1981, Ser. No. 246,773
Int. Cl.³ G01N *25/04*
U.S. Cl. 73—863.11 **9 Claims**

1. A method of preparing and studying supercooled and solidified samples of materials in bulk form in a low gravity environment comprising:

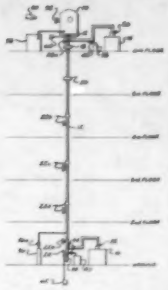
providing an enclosure;

positioning a sample specimen of said material in an environment out of contact with said enclosure;

heating said specimen to form a specimen melt;

providing a drop tube assembly having a hollow drop tube disposed at a level generally below said specimen positioned in alignment therewith having a sufficient height to facilitate supercooling of said specimen melt falling therethrough;

supercooling said specimen melt by allowing said melt to fall freely through said drop tube wherein said melt is cooled by radiation and solidifed; and



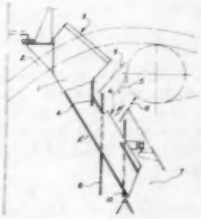
catching said solidified specimen adjacent the end of drop tube whereby said specimen may be removed for analysis.

4,389,905

CUTTER FOR COLLECTING A REPRESENTATIVE SAMPLE

Semyon Lanin, and Vladimir Lanin, both of 330 Wadsworth Ave., Apt. 6F, New York, N.Y. 10040

Filed Jul. 27, 1981, Ser. No. 287,144
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.54 **5 Claims**



1. A sampling cutter for a sampling machine, the cutter having a housing with a first feed opening (3) for direct sampling of material moving in the main discharge trajectory of a stream to be sampled and a chute part for diverting sampled material to a chute (7) of a sampling system, said chute part having a second feed opening (4) for sampling material moving separately from the main stream, means for supporting and moving the cutter through the stream of material to be sampled, and means for preventing arbitrary entrance of conveyed material into the chute (7) of the sampling system.

4,389,906

AUTOMATIC CROSSCUT SAMPLER

Donald O. Bartholomay, Minneapolis, Minn., assignor to Gustafson, Inc., Eden Prairie, Minn.

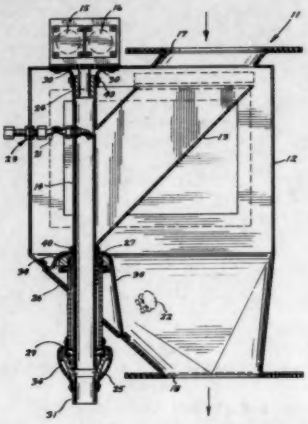
Filed Feb. 4, 1980, Ser. No. 117,954
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.55 **6 Claims**

1. Apparatus for drawing a representative sample of flowing particulate material from the spout of a conveying or dispensing system, comprising:

an enclosed housing with entrance and exit ports for connection into a section of the spout, the housing having an open interior with an unobstructed central flow passage permitting free flow of particulate material therethrough,

a sample collecting head mounted within the housing for

swinging movement about an axis parallel to that of the central flow passage, such that the collecting head can be swung from one side of the central flow passage to the other, passing entirely through the central flow passage, with the head having an elongate opening confronting the entrance port, and



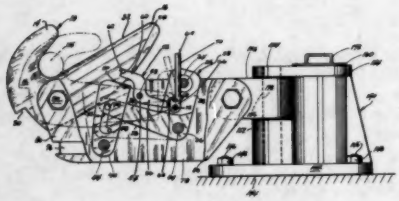
means for swinging the collecting head across the central flow passage, and said means comprises at least one rotary air cylinder secured to the sealed housing for producing such swinging.

4,389,907

RELEASABLE HOOK

Irving Epstein, 4216 Shoreclub Dr., Mercer Island, Wash. 98040

Filed Jun. 11, 1976, Ser. No. 695,119
Int. Cl.³ B63B *23/58;* B66C *1/34*
U.S. Cl. 74—529 **25 Claims**



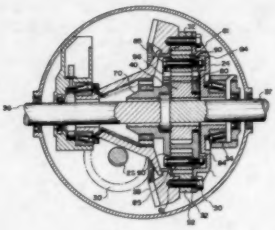
1. A locking mechanism comprising:
a. a rotatable member;
b. a stop;
c. said stop being mounted on a pawl;
d. said pawl being movable to move said stop for engagement and disengagement with said rotatable member;
e. a cam plate;
f. said cam plate being movable;
g. a cam follower on said pawl for following the movement of said cam plate;
h. a balance lever;
i. said balance lever having a bearing surface for bearing against said cam plates;
j. said balance lever being movable;
k. a release lever;
l. said release lever having a bearing surface for bearing against said balance lever;
m. said release lever being distinct and separate from said balance lever;
n. said balance lever and said release lever may move to be juxtapositioned to each other; and,
o. said release lever being movable for moving away from said balance lever to allow said balance lever to allow said cam plate to move to allow said pawl and said stop to move away from said rotatable member to allow said rotatable member to rotate.

4,389,908

PARTIALLY FLUID LOCKED DRIVE TRAIN

Harold M. Dudek, Bellevue, Wash., assignor to Astro Development Corporation, Seattle, Wash.

Filed Dec. 26, 1979, Ser. No. 106,716
Int. Cl.³ F16H *1/44*
U.S. Cl. 74—711 **5 Claims**



1. An improved fluid locked gear drive train for a transfer case of a differential or the like comprising:
an outer fluid tight housing;
an inner housing;
a planetary gear train within said inner housing, said gear train including a sun gear, a plurality of planet gears and an internal ring gear;
plate means positioned on opposite sides of said sun, planet and internal ring gears in close relation thereto and closely surrounding the peripheries of the gears;
means freely mounting at least one of said planet gears for allowing the ends of the planet gear teeth to be moved into closer relation with the plate means surrounding said gears to increase hydrostatic drag on said gears;
said plate means including fluid inlet and outlet ports aligned with teeth of said gears but with the inlet ports being spaced around the periphery of the gears a distance upstream in the direction of fluid movement from a point of mesh between two meshing gears for delivering fluid to a point of mesh between the gear and between said closely spaced planet gear and the plate means for increasing the hydrostatic fluid pressure on the teeth in such closer relation and thereby increasing fluid resistance drag on the planet gears for partial fluid lock; and
means for delivering fluid into said inner housing and maintaining the inner housing in a generally filled condition and filling the space between the gear teeth and the plate means.

4,389,909

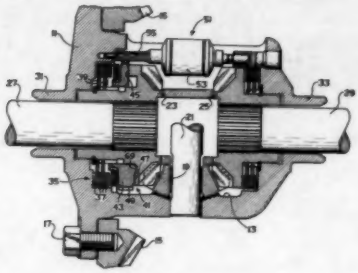
CAM MECHANISM FOR LIMITED SLIP OR LOCKING DIFFERENTIAL

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 26, 1981, Ser. No. 266,874
Int. Cl.³ F16H *1/44, 53/00*
U.S. Cl. 74—711 **9 Claims**

1. A differential gear mechanism of the type including a gear case defining a gear chamber, differential gear means disposed in said gear chamber, said differential gear means including at

least one input gear and first and second output gears, lock-up means for locking up said differential gear means to retard differentiating action, said lock-up means including clutch means operable between an engaged condition, effective to retard relative rotation between said gear case and said output gears, and a disengaged condition, said lock-up means further including cam means operatively associated with said clutch means and including first and second cam members, said second cam member being axially movable relative to said first cam member in response to relative rotation therebetween to



effect said engaged condition of said clutch means; the improvement comprising:

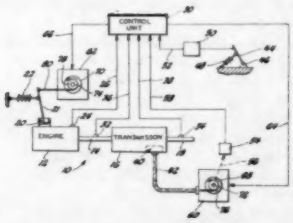
one of said first and second cam members having a cam surface including alternating rising surface portions and falling surface portions, each of said rising surface portions including a pad portion axially projecting slightly from said rising surface portion and extending over approximatey the upper half of said rising surface portion to concentrate engagement of the other of said first and second cam members with said rising surface portion on said upper half of said rising surface portion.

4,389,910

MOTOR VEHICLE POWER CONTROL MEANS

Bruce D. Lockhart, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1981, Ser. No. 234,696
Int. Cl.³ B60K *41/04*
U.S. Cl. 74—843 **5 Claims**



1. A method of controlling the driveline power response of a motor vehicle of the type having a throttle controlled engine and a multigear ratio automatic transmission wherein transmission gear shifting is determined according to the combination of vehicle speed and a control input applied to said transmission, said method comprising the steps of:

adjusting the engine throttle in a manner to bring a measured value of a power-related driveline parameter into correspondence with a requested value determined according to the setting of an operator controlled accelerator pedal;

adjusting said transmission control input according to a first schedule wherein said input follows the setting of said accelerator pedal or a second schedule effective when engaged to interrupt said first schedule and to adjust said control input in a manner to downshift said transmission to a lower gear;

engaging said second schedule when said engine enters a range of operation associated with reduced efficiency;

in response to the engagement of said second schedule, determining the maximum value of said driveline parameter available in a higher gear with engine operation outside said fuel inefficient range; and

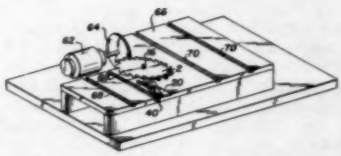
disengaging said second schedule when said maximum value exceeds said requested value whereby said engine and transmission are controlled in a manner to deliver a driveline response corresponding to the position of said accelerator pedal while avoiding engine operation under conditions of reduced efficiency.

4,389,911

CIRCULAR SAW SHARPENING ATTACHMENT

John K. Winning, 152 -1133 Pipeline Rd., Port Coquitlam, British Columbia, Canada

Filed Nov. 10, 1980, Ser. No. 205,213
Int. Cl.³ B23D *63/14*
U.S. Cl. 76—74 **9 Claims**



1. A holder for a circular saw blade to permit sharpening of the blade on a sharpener having a sharpening surface rotatable in a fixed plane, the holder comprising:

a bed to receive a saw blade;

means to position the blade on the bed;

a first slot in the bed;

a table to support the bed and having a first surface to support the bed and a second surface, a first edge and a second edge;

a second slot in the table;

means extending through the first and second slots to releasably attach the table and the bed to allow pivoting of the bed relative to the table and locking of the bed and the table at a predetermined relative position;

a projection formed on the second surface of the table, at the first edge, whereby when the holder is placed on a level surface the table inclines downwardly from the first edge to the second edge to define the angle of presentation of the blade on the holder to said fixed plane in which the sharpening surface of the sharpener is rotatable with the length of the first edge of the table being at a uniform distance from said level surface.

4,389,912

TWEEZERS FOR REMOVAL OF DUAL IN-LINE PIN (DIP) COMPONENTS

Robert E. Dallons, Agoura, and William S. Fortune, Malibu, both of Calif., assignors to Edsyn, Inc., Van Nuys, Calif.

Filed Feb. 23, 1981, Ser. No. 237,330
Int. Cl.³ B25B *9/02, 27/14*
U.S. Cl. 81—43 **11 Claims**

1. A pair of tweezers for removing a DIP component from a circuit board comprising:

(a) a pair of tweezer legs of identical shape, each of said legs having an upper portion which is substantially straight, followed by an inwardly curved, convex portion and followed, in turn, by an oppositely curved portion;

(b) each of said legs having a sharply inwardly bent end portion formed into claws for gripping a DIP component, and a circular aperture near the inwardly curved end portion;

(c) means for securing the uppermost portions of said legs together; and

(d) a sliding clamp having two parallel portions for sliding along the upper portion of said legs and interconnected to form a U-shaped structure, said clamp being rotatable with respect to said legs when disposed at the uppermost portion of said legs, each of said parallel portions being

provided with a centrally located elongated slit, and means on said upper portions of said legs and extending through an opening for securing said clamp in a desired position along said slit with respect to said legs, to space said claws a desired distance apart for gripping a particular DIP component, whereby a row of pins of a DIP component may be straightened out by placing it between the upper portions of said legs when said clamp is rotated away from said legs and thereafter squeezing said legs together by said clamp, and whereby the space between said claws is adjustable by sliding said clamp up or down.

4,389,913

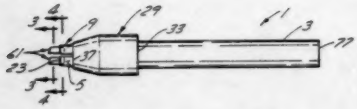
SCREW EXTRACTOR

Gilbert Drouin, 47 St. Andre, St-Luc, Quebec, Canada (JOJ 2AO); Jean Lacoste, 1530 Ouest Bl. Dernard, Apt. 14, Outremont, Quebec, Canada (H2V 1W8), and Gilles Tremblay, 354 Redfern, Westmount, Quebec, Canada (H3Z 2G5)

Filed Mar. 3, 1981, Ser. No. 239,987

Int. Cl.³ B25B *13/50*

U.S. Cl. 81—53.2 **3 Claims**



1. A tool for use in extracting a broken fastener, the tool comprising a main body, a tubular-shaped extension comprised of a plurality of slightly spaced apart, flexible curved fingers projecting from one end of the body, size-reducing means for radially reducing the size of a free end of the fingers, cutting means projecting axially from said free end of the fingers, said cutting means being radially movable by action of said size-reducing means such that said cutting means can be sized to cut around the broken fastener, gripping means comprising a plurality of teeth extending inwardly from said fingers, said gripping means being radially movable to grip the broken fastener subsequent to operation of said cutting means, each of said teeth having one side extending radially and the other side extending generally tangentially so as to securely grip the broken fastener upon a slight rotation of the body, the tangential side leading when the tool is rotated in the direction in which the fastener was rotated to fasten.

4,389,914

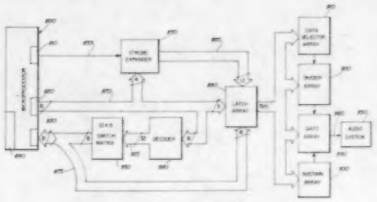
CHORD IDENTIFICATION SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENTS

Dale M. Uetrecht, Colerain Township, Hamilton County, Ohio, and Carlton J. Simmons, Jr., Florence, Ky., assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Jun. 18, 1981, Ser. No. 275,082

Int. Cl.³ G10H *1/38, 7/00*

U.S. Cl. 84—1.01 **6 Claims**



1. A process for identifying the chord type and root represented by the actuation of one or more playing keys of a musical instrument keyboard capable of representing a group of chord types based on a group of roots, each of the playing keys corresponding to one note, said process employing a switch matrix and multiple-location memory and comprising the steps of:

scanning said switch matrix and comparing the state of the switches therein to the state of corresponding bits in said multiple-location memory;

selectively enabling a means for chord identification;

determining the chord type and the root of the chord being played by selectively iteratively transposing said chord whereby said chord is identifiable by the number of notes contained therein and the interval relationship thereof; and

storing in said multiple-location memory said chord type and said root for processing, whereby said processing generates a signal for the synthesis of music which is compatible with the chord being played.

4,389,915

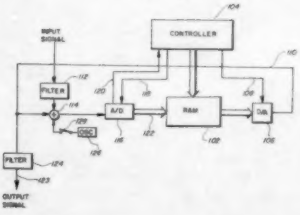
MUSICAL INSTRUMENT INCLUDING ELECTRONIC SOUND REVERBERATION

Angelo A. Bione, Elmhurst, Ill., assignor to Marmon Company, Chicago, Ill.

Filed Dec. 18, 1980, Ser. No. 217,911

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **6 Claims**



1. An electronic musical instrument having circuitry for generating a tone signal representative of a musical tone and a reverberation circuit for receiving said tone signal and producing a reverberated tone signal, said reverberation circuit comprising:

first converter means receiving an analog input and providing a digital data word output;

a random access memory receiving said digital data word output from said first converter means, providing a digital output signal and having a plurality of addressable memory locations froming at least a first channel and a second channel, each of said channels being separate and individual from said other channels and each comprising a different number of memory locations, each of said memory locations stores a digital data word output from said first converter;

second converter means receiving said digital output signal from said random access memory and providing an analog delay output;

addressing means comprising at least first and second counter circuits, said first counter circuit generating first address signals connected to said random access memory and defining said first separate and individual channel in said random access memory and said second counter circuit generating second address signals connected to said random access memory and defining said second separate and individual channel in said random access memory;

first control means having a first control output signal connected to said second converter means for transferring a data word from a predetermined memory location in said random access memory to said second converter whereby said analog delay signal output is generated by said second converter in response to said data word;

a mixer circuit for receiving said analog delay signal of said second converter and said tone signal and combining a portion of said analog delay signal of said second converter with said tone signal and providing a mixed signal as said analog input to said first converter;

second control means having a second control output signal connected to said first converter for enabling said first converter to generate said digital data word output in response to said mixed signal;

third control means having a third control output signal connected to said random access memory for transferring said digital data word generated in response to said mixed signal to said input of said random access memory and into said predetermined memory location from which the original digital data was transferred by said first control means;

Sequencer means having a plurality of sequence output signals at least one of which is connected to each of said first, second and third control means and said addressing means for providing data words from said random access memory with one individual word being transferred from each of said separate and individual channels in repeated channel sequence and with each of said individual data words being transferred from each of said separate and individual channels sequentially; and

an output circuit for receiving, filtering and intergrating said analog delay signal from said second converter means and for generating said reverberated tone signal.

4,389,916

VIOLIN SUPPORT

Olof J. J. Ruthström, Djurgardsvägen 144, S-115 21 Stockholm, Sweden

PCT No. PCT/SE80/00139, § 371 Date Jan. 14, 1981, § 102(e) Date Jan. 14, 1981, PCT Pub. No. WO80/02617, PCT Pub. Date Nov. 27, 1980

PCT Filed May 13, 1980, Ser. No. 232,045

Claims priority, application Sweden, May 14, 1979, 7904223

Int. Cl.³ G10G *5/00*

U.S. Cl. 84—278 **3 Claims**

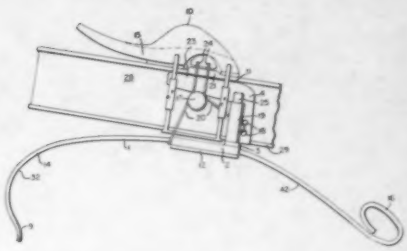
1. A support assembly for a string instrument of the violin family, said string instrument having a chin rest, a stringholder with a saddle, a stringholder cord and a button for securing the stringholder cord located on a side wall of the instrument which, when played upon, is kept in a position between a jaw bone and a collar bone, comprising:

(a) a bendable bow member adapted to be bent to conform to the player's body, said bow member having one end adapted to rest on the chest of the player and a second end adapted to rest on the back of the player;

(b) a support structure movably mounted on said bow member, said support structure adapted to be positioned on said bow member to rest on the collar bone of the player;

(c) a pivot part mounted on said support structure and extending upwardly therefrom transverse of the plane of the instrument body;

(d) a mounting plate having a wedge shaped part adapted to



be positioned between said stringholder cord and said side wall in the horizontal direction and between said button and said saddle in the vertical direction, said mounting plate having a means connected thereto for receiving said pivot part;

(e) said pivot part and said receiving means including adjustable means for constraining pivotal movement therebetween; and

(f) flexible means for removably securing said mounting plate and said bow member together.

4,389,917

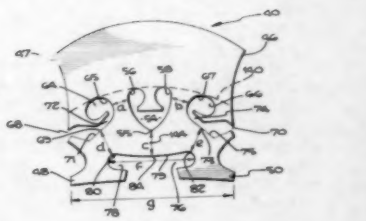
VIOLIN AND VIOLA BRIDGE

Ralph H. Tiebout, III, 2527 Hyler Ave., Los Angeles, Calif. 90041

Filed Jul. 24, 1981, Ser. No. 286,580

Int. Cl.³ G10D *3/04*

U.S. Cl. 84—309 **79 Claims**



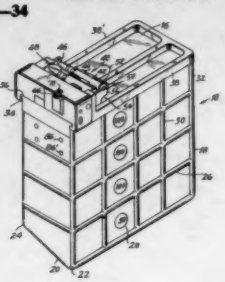
1. An improved bridge for a violin of the type comprising an integrally formed member adapted to rest upon the belly of the violin and extend transversely beneath the strings with a convexly curved upper surface for supporting the strings, characterized in that it has a central opening and a pair of lateral edge openings for increasing its flexibility and hence sound transmitting and amplifying capability with the upper boundary of the three openings lying along a curved path that is substantially parallel to the curved upper end of said bridge and further characterized in that its bottom end has feet on its lateral edges with a bottom channel therebetween, the upper extremity of the channel being formed by a slightly downwardly convex surface of the bridge.

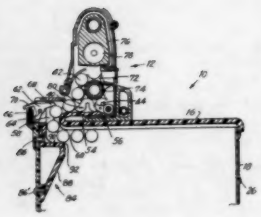
4,389,918

AMMUNITION BELT FEED MAGAZINE SYSTEM

John H. Peck, Fountain Valley, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 26, 1981, Ser. No. 267,126
Int. Cl.³ F41C 25/00
U.S. Cl. 89—34 **1 Claim**





1. A feed magazine for feeding linked rounds into a feed mechanism of an automatic weapon, comprising:

a container having at least two generally parallel sides, two ends, a top and a bottom;

said sides having means for sliding engagement under said weapon for mounting said container in a generally linear travel;

a delivery slot in said top for delivery of said linked rounds to said automatic weapon; and

means for retaining at least one leading round in a position external to said container from which position said leading round can be engaged by said feed mechanism and fed to said automatic weapon upon completion of said mounting;

wherein said bottom is sloped from one of said sides to the other thereof whereby, when said container is substantially full of linked rounds, a top layer of said rounds is permitted to lie substantially parallel to said top.

4,389,919

FIRING PIN BLOCK FOR FIREARM WITH A ROTARY BREECH BOLT

Jack L. Kast, Ilion; Albert R. Eddy, Frankfort, and Merle F. Carter, Mohawk, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 121,437, Feb. 14, 1980, abandoned. This application May 3, 1982, Ser. No. 374,156
Int. Cl.³ F41D 3/06, 11/16
U.S. Cl. 89—185 **6 Claims**

1. A firearm having a receiver, and a barrel secured to said receiver and having a rearwardly-open breech formed with locking lugs;

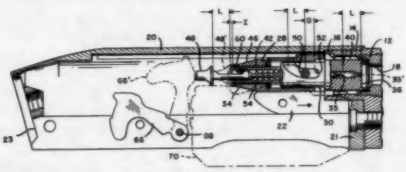
a bolt carrier reciprocable in said receiver along a longitudinal axis but restrained against rotation thereabout, said bolt carrier having a rearward extension;

a breech bolt having a front face adapted to close said breech, being formed with locking lugs engageable by rotation of said bolt to lock said bolt to said breech lugs, and being reciprocable and rotatable in said bolt carrier with respect to said axis;

a firing pin having a flat formed thereon, and received in said bolt for sliding movement along said axis between a position retracted behind said face and a position protruding therefrom, and having an enlarged abutment formed rearwardly thereon, said abutment being aligned with said rearward extension of said bolt carrier along said axis so that the extreme forward displacement of said firing pin with respect to said bolt carrier is limited by direct engagement of said abutment with said rearward extension;

cam means drivingly connecting said bolt with said bolt carrier, said cam means comprising a cam slot in said bolt and a cooperating cam pin secured to said bolt carrier and slidable in said cam slot; said cam slot having a curved rear section extending along said axis and through an angle thereabout, and having a longitudinal forward section extending substantially parallel to said axis;

said cam means being constructed and arranged: for effecting a forward longitudinal movement of said bolt to close



said face against said breech, in response to an initial forward movement of said bolt carrier; for effecting movement of said cam pin through said curved rear cam section to rotate said bolt and said lugs into locking engagement with said breech, in response to a further forward movement of said bolt carrier; and for allowing movement of said cam pin through said longitudinal forward cam section while restraining said bolt against rotation with respect to said breech, in response to a continued forward movement of said bolt carrier;

said rearward extension of said bolt carrier extending rearwardly to a length sufficient to block said firing pin against displacement into said protruding position during movement of said cam pin throughout said rear cam section, and to be displaced forwardly to a position enabling said firing pin to be moved into said protruding position only after entry of said cam pin into said longitudinal forward section of said cam slot;

and a retaining pin received in said flat for free sliding movement of said firing pin along said axis within limits defined by the length of said flat, said retaining pin being secured in said bolt whereby, upon completion of said forward longitudinal movement of said bolt against said breech, forward movement of said firing pin from said retracted position is restricted solely by said rearward extension of said bolt carrier.

4,389,920

SEMIAUTOMATIC FIREARM

Joseph H. Dufour, Sr., 848 Castlewood Dr., Baton Rouge, La. 70815

Filed Feb. 20, 1981, Ser. No. 236,493
Int. Cl.³ F41D 5/04
U.S. Cl. 89—190 **29 Claims**

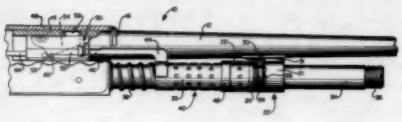
1. In a semiautomatic firearm having (i) a receiver, (ii) a barrel mounted to said receiver, (iii) a magazine positioned adjacent to said barrel, (iv) a bolt assembly reciprocally

mounted in said receiver, said bolt assembly having locking structure for locking said bolt assembly in the battery position, and unlocking structure for unlocking the lock achieved by said locking structure, the improvement which features a gas operated system which comprises:

a. gas powered means in association with said barrel and said magazine, said gas powered means being actuated by expanding gas to provide powered movement by at least a portion of said gas powered means towards said receiver;

b. at least one gas channel extending from the interior of said barrel to said gas powered means to communicate said expanding gas to said gas powered means when said firearm is fired;

c. drive means having its proximate end in association with



said gas powered means whereby said powered movement by said at least portion of said gas powered means imparts movement to said drive means towards the receiver, said drive means having at its distal end a rod means adjacent but not connected to said unlocking structure, whereby said movement of said drive means operatingly engages said rod means with only said unlocking structure to unlock said lock structure so that said bolt assembly is free to move away from said battery position; and

d. return means in contact with said drive means for preventing impacting of said drive means with said receiver and for returning said drive means and said rod means to their original prior position so that said bolt assembly is free to return to the battery position and said locking structure can re-attain its locking of said bolt assembly.

4,389,921

EXPANSIBLE CHAMBER APPARATUS AND ITS OPERATION

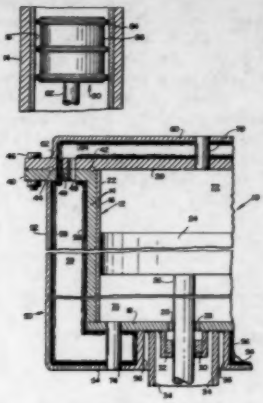
Vannevar Bush, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 824,189, Aug. 12, 1977, Pat. No. 4,250,953, which is a continuation of Ser. No. 623,108, Oct. 16, 1975, abandoned, which is a continuation of Ser. No. 78,902, Oct. 7, 1970, abandoned. This application Jul. 18, 1980, Ser. No. 170,231

Int. Cl.³ F01B *29/04*; F16J *11/02*

U.S. Cl. 92—59 **4 Claims**

1. Expansible chamber apparatus comprising a cylinder, a ceramic lining internally mounted on the cylinder side walls, heat controlling means connected to the expansible chamber apparatus for controlling operating temperature of the cylinder, a shaping piston having a projection peripherally extending from the outer radial surface of said shaping piston into engagment with the ceramic lining, reciprocating means connected to the shaping piston for reciprocating the shaping piston in the cylinder whereby the lining of the apparatus conforms to outer dimensions of the projection when the operating temperature is reached, and further comprising a substitute piston comprising a permanent piston having an outer dimension commensurate with the outer dimension of the projection, and wherein the reciprocating means comprises detachable connecting means connected to the shaping piston for allowing detachment of the shaping piston from the reciprocating means and for allowing attachment of the permanent



piston, whereby the permanent piston may be mounted within the cylinder.

4,389,922

REVERSING LOW PRESSURE LUBRICATING VALVE

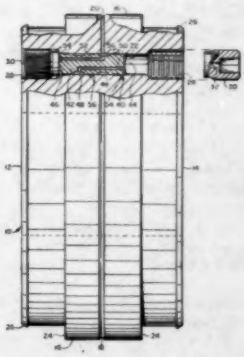
Ronald Tatters; John E. Dolman, both of Victoria, Canada, and Donald R. Howell, deceased, late of Victoria, Canada (by June E. Howell, executrix), assignors to Her Majesty the Queen in right of Canada as represented by the Minister of Defence, Ottawa, Canada

Filed Mar. 20, 1981, Ser. No. 294,545

Claims priority, application Canada, Sep. 26, 1980, 361479

Int. Cl.³ F01B *31/10*

U.S. Cl. 92—156 **9 Claims**



1. A lubricating valve for use in a moveable piston having an internal chamber extending through the same, the piston also having a supply groove extending peripherally thereof and an internal channel which interconnects the chamber with the supply groove, said lubricating valve comprising:

(a) a body adapted to be closely received in said internal chamber and slidably moveable therein responsive to pressure changes in said internal chamber, said body including two oppositely disposed end faces, said internal chamber, in operation, having alternatively a low pressure side and a high pressure side;

(b) a plurality of distribution channels extending peripherally of the body; and

(c) a plurality of feed holes in said body corresponding to the distribution channels, each feed hole functioning to interconnect a related one of said distribution channels with one of said end faces and a portion of the internal chamber adjacent to it; such that a high pressure on one or other side of the piston causes said valve to be moved within said internal chamber in the direction of lower pressure while said distribution channels enable a lubricant to be conducted from the low pressure side of said internal chamber to the peripheral supply groove to lubricate the walls of a cylinder in which said piston is moveable.

4,389,923

EXHAUST APPARATUS FOR REMOVING POLLUTANTS

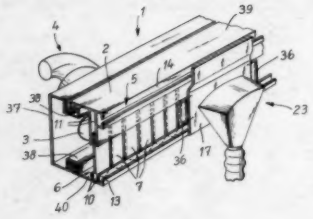
Horst Ludscheidt, Westfälische Str. 171, 4600 Dortmund, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,768

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015129; Sep. 17, 1980, 3035052; Nov. 3, 1980, 3041350

Int. Cl.³ F23J *15/00*

U.S. Cl. 98—115 VM **26 Claims**



26. Apparatus for removing pollutants, particularly automotive exhaust gases, from work areas or the like comprising elongate stationary duct means for exhausting pollutants therethrough, elongate movable duct means, first bearing bracket means longitudinally movable along said stationary duct means connecting said movable duct means with said stationary duct means, first displaceable sealing means on said stationary duct means adapted to be moved by said first bearing bracket means between a position sealing said stationary duct means and a position allowing said movable duct means to be placed in flow communication with said stationary duct means as said first bearing bracket means is moved along said stationary duct means, exhaust hose means adapted to receive pollutants operatively connected with said movable duct means, second bearing bracket means longitudinally movable along said movable duct means connecting said exhaust hose means with said movable duct means, and second displaceable sealing means on said movable duct adapted to be moved by said second bearing bracket means between a position sealing said movable duct means and a position allowing said exhaust hose means to be placed in flow communication with said movable duct means as said second bearing bracket means is moved along said movable duct means, said first and said second displaceable sealing means comprising sealing elements constructed in the form of link elements connected with each other and movable relative to each other.

4,389,924

COFFEE MACHINE

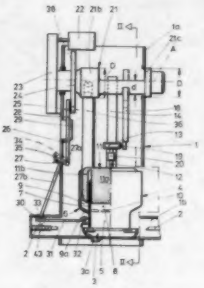
Helmut Hoesselbarth, Weilheim, Fed. Rep. of Germany, assignor to Wurttembergische Metallwarenfabrik, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,183

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014452

Int. Cl.³ A47J *31/36*

U.S. Cl. 99—289 R **35 Claims**



1. A coffee machine of the type including a horizontal guide track means and a brewing unit mounted for reciprocal movement on said guide track between predefined rest and brewing positions, said machine comprising:

first and second slide means mounted for sliding movement on said track means;

a straining unit mounted to said slide means for movement therewith;

a brewing chamber with an open bottom mounted above said straining unit to said second slide means for movement therewith, said brewing chamber being movable into a predefined loading position in alignment with said straining unit, said first and second slide means having cooperating means for moving said brewing chamber into said brewing position together with said straining unit, and into an emptying position at which it is horizontally displaced with respect to said straining unit;

a cylinder joined with said brewing chamber and extending thereabove, said cylinder forming a structural unit with said brewing chamber and being moved together therewith along said guide track means; and

plunger means mounted for axial movement at said brewing position in a direction generally perpendicular to the movement of said structural unit, whereby said plunger means is axially movable into and out of said cylinder when the same is in the brewing position, for forcing into said brewing chamber brewing water which is provided to said cylinder.

4,389,925

BEVERAGE EXTRACTING AND DISPENSING MACHINE

Giuseppe S. Piana, Milan, Italy, assignor to UNOPER S.r.l., Attinara, Italy

Filed Jun. 10, 1981, Ser. No. 272,240

Claims priority, application Italy, Jun. 11, 1980, 22723 A/80

Int. Cl.³ A47J *31/30*

U.S. Cl. 99—289 R **8 Claims**

1. A beverage extracting and dispensing machine for use with cartridges having an imperforate substantially cylindrical sidewall and upper and lower permeable substantially flat walls and containing a brewable product from which a beverage can be obtained by flowing hot water under pressure therethrough, said machine including:

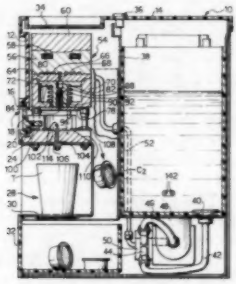
a lower support defining a sliding horizontal path on which the cartridge is adapted to rest and to slide with its lower wall, said sliding path having a leading section adapted to receive a new cartridge to be used, an intermediate brewing station and a trailing edge over which an old cartridge may be dumped after use,

an upper presser plate movable to and from said sliding path above said brewing station, said presser plate, when in a lowered position, being adapted to tightly engage the upper wall of a cartridge in the brewing station, and when in a raised position being disengaged from the cartridge, said presser plate having an inlet passage therethrough which opens to the upper permeable wall of the cartridge in the brewing station;

means for lowering the presser plate into engagement with the cartridge in the brewing station,

means for forcing hot water under pressure through said inlet passage and through said cartridge in the brewing station,

a filling station underlying said support and adapted to receive a container for the beverage, said support having a lower outlet nozzle which communicates with the brewing station through an outlet passage in the support to fill the container in the filling station with the beverage flowing from the lower wall of a cartridge in the brewing station,



a pair of movable clamping jaws mounted on said support, one on each side of said sliding path, said clamping jaws having respective concave surfaces adapted to closely embrace the sidewall of a cartridge in the brewing station, and respective bevelled cam surfaces turned towards said leading section of the sliding path and defining therebetween an entrance gap leading to the brewing station, said jaws being resiliently biassed towards each other to a cartridge clamping position and being adapted to be spread apart by the co-operation of the sidewall of a new cartridge with the bevelled cam surfaces when the cartridge is pushed from said leading section to the brewing station through the entrance gap, and said jaws, when spread apart, being adapted to allow an old cartridge to be pushed away from the brewing station and to be dumped over the trailing edge under the thrust of the new cartridge which is pushed to the brewing station,

control means operable to control a brewing cycle which includes the successive steps of lowering said presser plate to the lowered position and onto the cartridge in the brewing station, forcing a predetermined amount of hot water under pressure through said cartridge and dispensing a corresponding amount of beverage from said nozzle, and allowing said presser plate to return to the raised position,

and sensing means to sense the spread apart condition of said jaws for starting the operation of said control means to accomplish the brewing cycle.

4,389,926

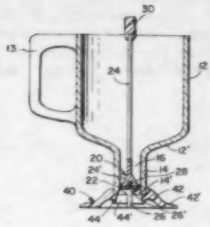
STOCK/SAUCE SEPARATOR

Auvin H. Joyner, 43-39 39th Pl., Apt. 43, Sunnyside, N.Y. 11104

Filed Jun. 15, 1981, Ser. No. 273,433

Int. Cl.³ A47J 43/28

U.S. Cl. 99—495 **13 Claims**



1. A cooking utensil for separating oil and fats from liquids comprising: a storage vessel for storing therein a liquid which is to be separated from oil and fat at the top of the liquid, said storage vessel comprising a main body portion, and a secondary portion extending from said main body portion having an opening formed therein through which the liquid is removed from said main body portion; and valve means positioned within said secondary portion for controlling the outflow of the liquid through said second portion, said valve means comprising a shaft reciprocally movable within said secondary portion, a flexible element affixed to said shaft for movement therewith, said flexible element being movable along at least a portion of the length of said opening formed in said secondary portion to control the outflow of the liquid therethrough, and means for attaching said flexible element to said shaft; said opening having a first elongated straight portion extending from said main body portion, and a second portion extending from the end of said first portion not connected to said main body portion, said second portion being outwardly tapering in a direction away from said first portion along the length thereof, said flexible element having a diametrical cross-sectional area approximately equal to the diametrical cross sectional area defined within said first portion of said opening, to thereby restrict positioning of said flexible element to the junction between said first and second portions or within said second portion, whereby when said flexible element is positioned at said junction the liquid within said storage vessel is prevented from flowing through said opening, and when said flexible element is positioned within said second portion of said opening the liquid is allowed to flow outwardly therethrough, support means extending from said secondary portion for supporting said storage vessel onto a support surface, and foot means depending from said flexible element and extending through said support means, the length of said foot means being such as to just reach the bottom of said support means when said flexible element is positioned at said junction, whereby when said storage vessel is placed on a support surface said flexible element is retained at said junction.

4,389,927

METHOD AND APPARATUS FOR SEPARATING APRICOT KERNELS FROM HUSKS

Alan W. Crompton, 13 The Crescent, Marryatville, South Australia, Australia, assignor to Alan Woodhouse Crompton, Marryatville, Australia

Filed May 11, 1981, Ser. No. 262,291

Int. Cl.³ A23N 5/00

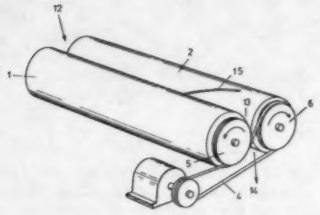
U.S. Cl. 99—575 **3 Claims**

1. Apparatus for finally separating kernels from partial shells of apricot stones wherein said apricot stones have been previously processed to medially fracture each of said shells creat-

ing a partial shell with said kernel therein, said apparatus including:

a pair of rollers for separating said kernel from said partial shell each spaced one from the other and supported for rotation and each having an outer surface and an input end and output end, and said rollers inclined with said input end elevated above said output end;

motive means connected to said rollers for clockwise rotation of one of said pair of rollers and counterclockwise rotation of the other of said pair of rollers whereby said medially fractured shell will be tumbled causing the release of some of



said kernels therefrom and pass said shells downward to be discharged from said outlet end;

means associated with said pair of rollers to adjust the space between rollers whereby only said kernels may pass between said rollers; and

kernel dislodgment means projecting from at least one of said rollers of a height no greater than the space between said rollers and located toward the outlet end of said rollers, whereby tumbled partial shells still containing said kernels will be impacted and said kernels will be dislodged and fall through said space between said rollers.

4,389,928

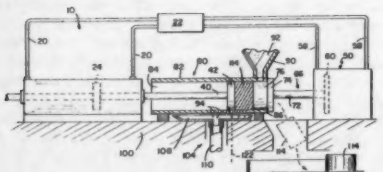
METHOD FOR PRODUCING AND COLLECTING A LIQUID EXTRACT AND A DRY BY-PRODUCT FROM A MASH

Kermit H. Burgin, R.R. 1, Box 334, Whitestown, Ind. 46075

Division of Ser. No. 135,922, Mar. 31, 1980, Pat. No. 4,343,233. This application Apr. 14, 1982, Ser. No. 368,215

Int. Cl.³ B30B *13/00*

U.S. Cl. 100—37 **4 Claims**



1. A method for producing and collecting a liquid extract and a dry by-product from a mash, comprising the steps of moving a first plunger in a first direction to close an open end of an extraction chamber, moving a second plunger in the first direction within the chamber to open a filler opening in the chamber in proximity to the open end to allow the chamber to be filled with mash, further moving the first plunger in the first direction in the chamber to close the filler opening, moving the second plunger in a second direction opposite to the first direction in the chamber to compress the mash between the first and second plungers thereby to extract the liquid and form a pressed dry by-product therefrom, collecting the liquid extract, expelling the dry by-product from the extraction chamber by moving the first and second plungers in the second direction to open the open end and discharge the dry by-product, and collecting the dry by-product.

4,389,929

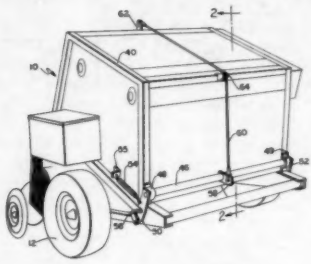
LATCHING MECHANISM FOR A ROUND BALER

Leroy Kluver, Celina, and John Arnold, Coldwater, both of Ohio, assignors to The Paul Revere Corporation, Greenwich, Conn.

Filed Jul. 13, 1981, Ser. No. 282,548

Int. Cl.³ B30B *5/06*

U.S. Cl. 100—88 **8 Claims**



1. A latching mechanism for use with a baler comprising:

a bale forming cavity defined by peripheral elements having at least one wall member that can move relative to another when actuated by the pressure of a bale acting on said moveable wall member;

a pin secured to one of said wall members;

a latch plate containing a groove which engages said pin to secure the moveable wall members to one another, the latch plate being moveable relative to said pin;

means for enabling the partial disengagement of said latch plate and said pin in response to a predetermined pressure of the bale on said moveable wall member;

means for preventing the total disengagement of said latch plate and pin following said partial disengagement;

means responsive to the partial disengagement of said latch plate and pin for sensing and signaling that said predetermined pressure has been reached; and

means for totally disengaging said latch plate and pin for disconnecting said two members from each other.

4,389,930

PRESSURE SENSING LATCH FOR A ROUND BALER

Paul C. Rutschilling, Coldwater, Ohio, assignor to The Paul Revere Corporation, Greenwich, Conn.

Filed Jul. 13, 1981, Ser. No. 283,045

Int. Cl.³ B30B *5/06;* **A01D** *39/00*

U.S. Cl. 100—88 **9 Claims**

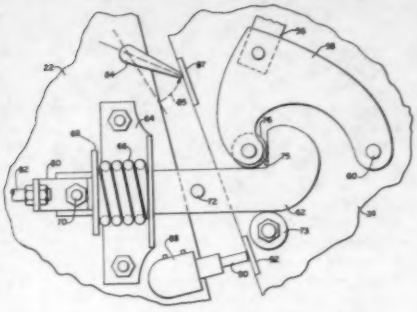
1. A latching mechanism for use with a baler comprising:

a bale forming cavity defined by peripheral elements having at least one wall member that can move relative to another;

a latching assembly having a first latch member secured to said moveable wall member and a second latch member secured to the other, the first latch member and second latch member being engageable to secure the moveable wall member from moving relative to another;

means associated with said latching assembly for enabling said latch members to partially disengage in response to a predetermined pressure on said moveable wall member;

means responsive to said partial disengagement to signal that the predetermined pressure has been achieved; and



means for totally disengaging said latch members to permit said cavity members to move relative to one another.

4,389,931

APPARATUS FOR THE COMPACTION OF FIBERS

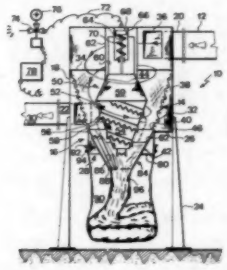
Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Jul. 20, 1981, Ser. No. 284,972

Claims priority, application Switzerland, Aug. 5, 1980, 5921/80

Int. Cl.³ B30B *9/00*

U.S. Cl. 100—90 **10 Claims**



1. An apparatus for the compaction of fibers comprising:

a housing;

means defining a fiber outlet arranged at one side of said housing;

a yieldable and expandable diaphragm means operatively associated with the fiber outlet;

a driveable plunger arranged in said housing and directed towards said fiber outlet;

means for moving said driveable plunger between a retracted terminal position and an advanced terminal position;

said means providing said fiber outlet forming a fiber chute which decreases in cross-section in a fiber outlet direction;

said fiber chute having an end portion located at an outlet side of said fiber chute;

at least said end portion of said fiber chute being formed by said diaphragm means;

said plunger, in its advanced terminal postion, directly penetrating into said diaphragm means; and

said diaphragm means being predominantly resilient in a direction transverse to said fiber outlet direction.

4,389,932

CALENDER WITH COMPOSITE OUTERMOST ROLLS

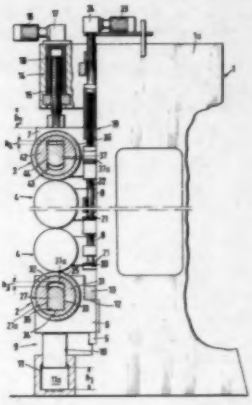
Josef Pav, Krefeld, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,672

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004913

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—162 B **9 Claims**



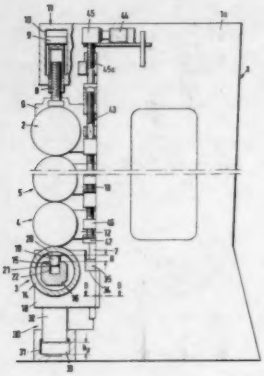
1. In a calender, the combination of a stand having upright guide means; a roll train mounted in said stand and including a plurality of rolls which comprise a first outermost roll constituting the lowermost roll and a second outermost roll constituting the uppermost roll of said train, each roll of said train being movable up and down relative to said stand, each of said outermost rolls comprising an elongated horizontal nonrotatable carrier and wherein at least some of said rolls are subject to treatment for removal of material from their peripheries whereby the diameters of the thus treated rolls are reduced; a rotary sleeve surrounding each carrier and movable with respect thereto radially of the corresponding outermost roll; hydrostatic displacing means installed in each sleeve and arranged to urge the sleeve toward the nearest roll of said train; and bearing means for the respective carrier, said bearing means being movable along said guide means with each of said sleeves being movable relative to the corresponding carrier to and from an end position, the sleeve and the carrier of one of said outermost rolls having cooperating limiting means for holding the sleeve of said one outermost roll against movement beyond the respective end position under the action of the corresponding displacing means, wherein the extent of radial movement of the sleeve of said one outermost roll plus the extent of movement of the bearings of said one outermost roll relative to said guide means suffices to allow for removal of any selected roll of said train from said stand; and means for moving at least one of said bearing means including means for shifting said bearing means for the carrier of said uppermost roll lengthwise of said guide means so as to compensate for the reduction of diameters of the treated rolls, and hydrostatic motor moving means for moving the carrier of said lowermost roll upwardly relative to said guide means, said shifting means being arranged to perform strokes having a length which at least equals the anticipated maximum combined reduction of diameters of said rolls, said stand having stationary stop means and wherein the bearing means of said lowermost roll has at least one portion normally abutting against said stop means under the action of said motor.

4,389,933

CALENDER

Josef Pav, Krefeld, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,197
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004915
Int. Cl.³ B30B 3/04
U.S. Cl. 100—162 B 20 Claims



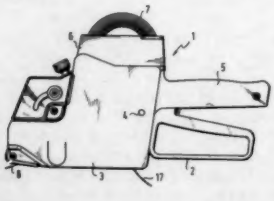
1. In a calendar, the combination of a stand having a pair of spaced apart upright guide means; a train of superimposed rolls in said stand, said rolls including an uppermost roll and a lowermost roll, said lowermost roll including a carrier non-rotatably mounted in said stand and a rotary sleeve surrounding said carrier and movable thereon radially toward and away from an upper end position, said carrier having first and second end portions respectively adjacent said first and second guide means and further comprising first and second bearings for the respective end portions of said carrier, said bearings being movable up and down along the corresponding guide means, said sleeve and said carrier having cooperating abutment means engaging each other in the upper end position of said sleeve; fluid-operated displacing means provided in said sleeve and operative to normally urge said sleeve to said upper end position; and means for biasing said uppermost roll toward said sleeve.

4,389,934

HAND LABELLING APPARATUS

Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,203
Int. Cl.³ B41L 47/46
U.S. Cl. 101—92 12 Claims



1. A hand labelling apparatus for printing and dispensing labels from a label strip including a carrier tape and said labels adhered to said tape, said apparatus comprising

a label strip supply roll;

a peel edge disposed downstream of said supply roll;

a tape feed mechanism disposed downstream of said peel edge and engaging said carrier tape to stepwise feed the label strip in a forward direction to said peel edge at which point the carrier tape is deflected around the peel edge and the labels are substantially separated from the carrier tape;

a printing mechanism disposed upstream of the peel edge having changeable type and movable from a non-printing position to a printing zone for printing predetermined information on successive labels, the distance between the printing zone and peel edge exceeding the length of each of said labels so that one of said labels will be disposed between the peel edge and the printing zone after each stepwise feeding of the label strip to said peel edge by the tape feeding mechanism;

return means for feeding the label strip in a return direction opposite to said forward direction;

an operating lever pivotable between a rest position and a working position,

means for connecting said operating lever to said return means and said tape feed and printing mechanisms so that (a) during movement of the operating lever from the rest position to the working position, said return means feeds said one label in said return direction to said print zone, (b) said one label is then printed by said printing mechanism, and (c) during movement of the operating lever from its working position to its rest position, the printed label is fed in the forward direction by the tape feed means to the peel edge where it is substantially separated from the carrier tape;

return stop means for disabling the return means for a predetermined portion of the movement of the operating lever between its rest and working positions so that the label strip movement in the forward direction in response to movement of said operating lever from the working position to the rest position exceeds that in the return direction by an amount equal to the length of one label

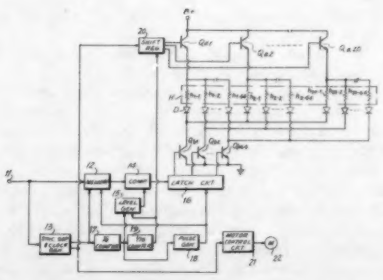
whereby in response to the movement of the operating lever to its rest position the last printed label is moved past said peel edge and no printed labels remain in said labelling apparatus even though the distance between said peel edge and the printing zone exceeds the length of each label.

4,389,935

METHOD AND APPARATUS FOR CONTROLLING A PRINTER

Kiyoshi Arai, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,055
Claims priority, application Japan, Nov. 5, 1980, 55-155541
Int. Cl.³ B41J 7/92, 7/70
U.S. Cl. 101—93.01 13 Claims



1. Apparatus for controlling a printer of the type having plural print heads each being selectively energizable to print an indicium whose relative intensity is represented by a data level and is determined by the duration of energization of that print

head, such that an indicium of uniform intensity is printed by a respective print head in response to a predetermined data level regardless of the number of print heads that are energized concurrently, said apparatus comprising storage means for storing data representing the intensity of the indicia to be printed by said print heads; intensity level signal generating means for generating successive, progressively increasing intensity level signals, each signal representing a respective intensity of an indicium to be printed; read-out means for reading out at a read-out rate the data stored in said storage means; comparison means for comparing the data read out for each print head to the intensity level signal then being generated, to produce a respective energizing signal if the intensity level represented by said data exceeds the intensity represented by said generated intensity level signal; energizing means for energizing those print heads for which energizing signals have been produced and maintaining the energization of those print heads until said energizing signals terminate; detecting means for detecting the number of print heads for which energizing signals are produced when a respective intensity level signal is produced; and varying means for varying the rate at which said intensity level signals are generated and the read-out rate at which said data is read out of said storage means as a function of said detected number and thereby vary the duration that said energizing means energizes said print heads as a function of the number of print heads which are energized concurrently.

4,389,936

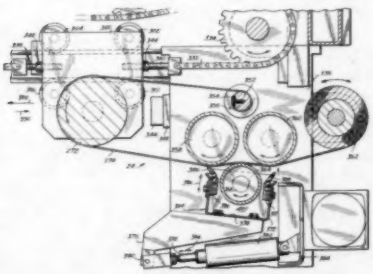
CLEANING ATTACHMENT FOR SCREEN PRINTER

David Jaffa, and Sandor Szarka, both of Franklin Lakes, N.J., assignors to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Nov. 18, 1980, Ser. No. 207,884

Int. Cl.³ B41F *35/00*; B41L *41/00*

U.S. Cl. 101—123 **15 Claims**



1. A printing apparatus for printing on a surface of a workpiece comprising:

a support frame,

screen printing means mounted on said support frame,

said screen printing means having an upper and a lower surface, and

cleaning means mounted on said support frame being positionally disposed adjacent said screen and adapted to clean said lower surface of said screen printing means with movement of said workpiece outwardly from under the printing screen means, wherein the cleaning means is a belt which has a portion thereof extended into contact with the underside of the screen printing means from said adjacent position and retracted back after cleaning.

4,389,937

FUZE FOR NON-SPINNING PROJECTILES

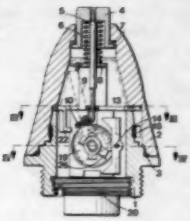
Jean-Pierre Golay, Viry, and Jean-Louis Uberti, Ferney-Voltaire, both of France, assignors to Mefina S.A., Fribourg, Switzerland

Filed Jan. 16, 1981, Ser. No. 225,601

Claims priority, application Switzerland, Jan. 29, 1980, 691/80

Int. Cl.³ F42C *9/02, 15/04, 15/34*

U.S. Cl. 102—249 **5 Claims**



1. A fuze for a non-spinning projectile including a body (1) a cap (2) rotatably mounted on said body, a hammer (5) in said cap, a detonator (20) in said body, a detonator safety device and a muzzle safety device, said fuze comprising pivot means (21) within said body, a rotor (11) mounted on said pivot means between a safety position and an armed position around an axis transverse to the axis of said fuze, a detonator primer (19) carried by said rotor, an inertia mass (10) mounted on said pivot means (21), a support (8) disposed in front of said rotor (11), a first spring (9) connecting said inertia mass (10) to said support (8), retaining means (22) secured to said cap (2) to prevent said inertia mass (10) from pivoting against the action of said spring (9), clutch means (12) rotatably secured to said pivot means (21), said clutch means (12) meshing with said fuze body (1) to prevent rotation of said rotor (11) whereby immobilizing of said rotor in an inclined position with respect to the axis of the fuze places said detonator primer (19) out of reach of said hammer (5) and away from the detonator (20) to provide detonator safety.

4,389,938

ILLUMINATING ROCKET POSSESSING A CYLINDRICAL CONTAINER

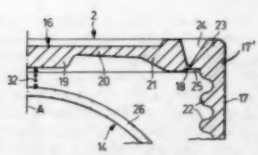
Hugo Sigrist, Hinwil, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Mar. 30, 1981, Ser. No. 249,214

Claims priority, application Switzerland, Apr. 22, 1980, 3087/80

Int. Cl.³ F42B *4/28*

U.S. Cl. 102—337 **4 Claims**



1. A flare rocket arrangement comprising:

a substantially cylindrical container having a front portion and a rear portion;

means defining an end wall for closing said front portion;

a removable cover member provided at the rear portion;

a flare rocket arranged within said container;

said container being rupturable at said end wall at said front portion when the flare rocket is ignited;

said container and flare rocket being arranged such that between the container and flare rocket there is provided an acceleration path, so that the flare rocket, when ignited, develops sufficient kinetic energy for rupturing the container;

the front end wall of the container being constructed to be resiliently yielding and can be bent-through by an amount corresponding to said accleration path due to the action of thrust forces of the ignited flare rocket;

said front end wall of the container possesses a substantially ring-shaped reference fracture location and a substantially disk-shaped inner portion;

said reference fracture location delimiting said ring-shaped inner portion;

the diameter of said inner portion being selected such that after rupturing said disk-shaped inner portion of said front end wall the ignited flare rocket can depart from said container;

said means defining said end wall comprises a threadable cover member provided for said container;

said threadable cover member being subdivided by said reference fracture location into said disk-shaped inner portion and said ring-shaped outer portion; and

said reference fracture location comprises a front substantially ring-shaped groove of substantially V-shaped configuration in cross-section and a rear, substantially ring-shaped groove of substantially rectangular shape in cross-section.

4,389,939

SHOTGUN CARTRIDGE

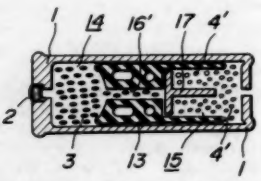
Hiroshi Ofuji, 21-14, Togoshi 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 181,236

Claims priority, application Japan, Mar. 28, 1980, 55-40160[U]

Int. Cl.³ F42B *7/02*

U.S. Cl. 102—458 **6 Claims**



1. A shotgun cartridge comprising

a hollow cylindrical shell having first and second ends and a longitudinal axis;

a charge of shot;

a plastic wad located intermediate the first and second ends of said shell, said plastic wad having an opening therein extending along said longitudinal axis and including a shot cup projecting from one end thereof, the other end of said plastic wad forming a first space between the first end of said shell and said wad for receiving gun powder, said shot cup and the second end of said shell defining a second space for receiving said charge of shot, said opening connecting said first space with said second space;

an identifying agent coating each shot in said charge, said identifying agent being ignitable to produce a visible trace; and

a solid firing device consisting solely of a combustible material located entirely within said second space, said solid firing device comprising a disc portion having first and second parallel surfaces with diameters greater than that of said opening and a projection having one of a cylindrical and rectangular shape extending from the first surface of said disc portion into said second space, the second surface of said disc facing the opening in said plastic wad and the projection of said solid firing device and the first surface of said disc being in physical contact with at least some of said shot, the igniting of said powder causing a flame to propagate through the opening in said plastic wad to ignite said firing device which in turn ignites the identifying agent coating said shot, the spread of said shot after ejection from said shell thereby being made visible by the burning of said identifying agent.

4,389,940

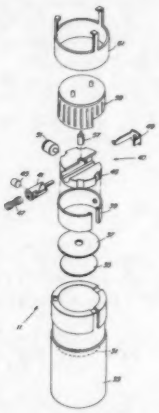
ANTIPERSONNEL MINE

Gray C. Trembly, Arlington; Ernest Goldberg, Westford, and Edward B. Dragun, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 2, 1976, Ser. No. 673,018

Int. Cl.³ F42B *13/50*; F42C *15/34*

U.S. Cl. 102—489 **2 Claims**



1. In an antipersonnel mine for delivery by a round of artillery having an explosive lead for a main charge, such lead being mounted in a slide interposed between such charge and an explosive detonator within such mine, the slide having a safe position wherein such detonator is inhibited from exploding such lead and an operating position wherein such detonator is allowed to explode such lead, the improvement comprising:

(a) means actuated by the slide to provide a visible indication outside such mine of the position of the slide and of such lead;

(b) a sear spring disposed within the mine in contact with the slide when the slide is in its safe condition; and

(c) a pressure-actuated latch disposed within the mine, such latch normally being in contact with the slide to lock the slide in its safe condition, such latch being disengaged by explosion of the round of artillery.

4,389,941

DRIVERLESS VEHICLE CONVEYOR SYSTEM

Donald M. Berk, Easton; Charles E. Jacoby, Bethlehem, and Larry Reagan, Wind Gap, all of Pa., assignors to SI Handling Systems Inc., Easton, Pa.

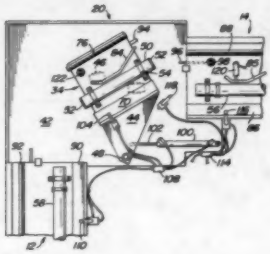
Filed Nov. 21, 1980, Ser. No. 209,243

Int. Cl.³ B61J *1/10*; B61B *13/12*

U.S. Cl. 104—49 **11 Claims**

1. In a driverless vehicle system wherein a driverless vehicle has support wheels which ride on tracks, comprising two

straight non-parallel sections of track having adjacent ends spaced from one another by a gap, a drive shaft parallel to the tracks in each of said straight sections, a transfer vehicle in said gap for supporting and transferring driverless vehicles across the gap from one straight section to the other, a drive shaft on said transfer vehicle, said transfer vehicle being mounted for oscillation along an arc about an upright axis from a receiving position adjacent one end of the gap to a discharge position adjacent the other end of the gap, said upright axis being located within the included angle defined by an extension of the axes of said drive shafts in said straight sections, motor means



connected to said transfer vehicle for oscillating said transfer vehicle, means for causing the rotation of one drive shaft associated with one of said straight sections to transfer a driverless vehicle onto the transfer vehicle and for using rotation of the drive shaft associated with the other straight section to discharge a driverless vehicle off the transfer vehicle, means for accumulating a driverless vehicle on one end of said straight sections of track when said transfer vehicle is not in its receiving position, limit stop means on the transfer vehicle for restraining a vehicle from discharging off the transfer vehicle, and means for releasing the last mentioned limit stop means when the transfer vehicle is in its discharge position.

4,389,942

SWITCH FOR A CARRIAGE OF A TWO TRACK SUSPENSION RAILROAD

Hans-Jürgen Düll, Langensendelbach, and Adolf Hillmer, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

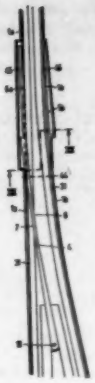
Filed Dec. 5, 1980, Ser. No. 213,639

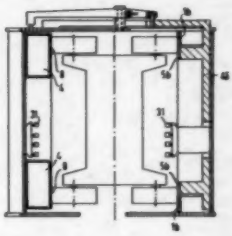
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949978

Int. Cl.³ B61B *3/00*

U.S. Cl. 104—103 **4 Claims**

1. In a switch for the carriage of a two track suspension railroad, in which two running surfaces for support wheels and, approximately perpendicularly thereto, parallel guide surfaces for lateral guide rollers are provided and in which, at the fork point of the inner guide surfaces, a central switch point pivoted about a vertical axis with guide surfaces on both long sides is linked onto the guide surfaces, the improvement comprising, the central switch point being made of one piece and two additional switch points in the region of its free end forming parallel guide surfaces, said additional switch points arranged in recesses of fixed guide surfaces and supported to be swung between the fixed guide surfaces and the central switch point, said guide rollers arranged in such a manner that they extend over the recess in the fixed guide surfaces and only one-half of their width cooperates with the fixed guide surfaces





on the one side, and on the other side with one of the additional switch points.

4,389,943

TRANSFER TRUCK

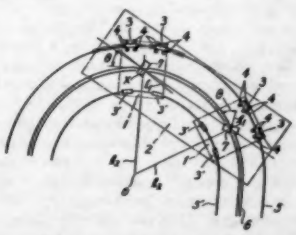
Minoru Watatani, Chiba, Japan, assignor to S. I. Handling Systems, Inc., Easton, Pa.

Filed Dec. 5, 1980, Ser. No. 213,422

Claims priority, application Japan, Dec. 12, 1979, 54-172716[U]

Int. Cl.³ B61B *13/12*

U.S. Cl. 104—166 **3 Claims**



3. A driverless transfer truck system comprising rails, a chassis having support wheels for riding said rails, a drive shaft rotatable about its axis disposed parallel to and between said rails, at least two drive wheels supported by the truck chassis for engagement with said drive shaft at the 12 o'clock position thereon so that a propelling force is produced by friction engagement with the drive shaft, means for enabling the truck

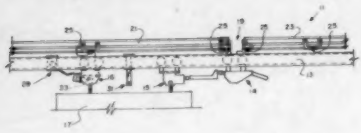
chassis to negotiate turns at a uniform speed, said means including a pair of bogies pivotably mounted to said chassis and located below the chassis, one of said drive wheels being centrally supported by each of said bogies, each bogie supporting two sets of said support wheels, said support wheels and drive wheels being at substantially the same elevation.

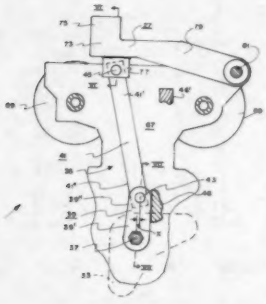
4,389,944

CONVEYOR CONTROL MEANS

Leon Linton, and David B. Kiss, both of Memphis, Tenn., assignors to Southern Systems, Inc., Memphis, Tenn.

Filed Mar. 30, 1981, Ser. No. 249,221
Int. Cl.³ B61B *10/02*
U.S. Cl. 104—172 S **5 Claims**





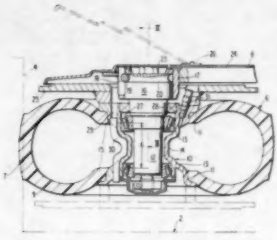
4. Control means for a conveyor system which includes a trolley member selectively driven by a pusher member to move a load from one location to another, said control means comprising: a dog means attached to said trolley member for movement between a first position in engagement with said pusher member and a second position out of engagement with said pusher member; a first drive means for moving said dog means from said second position to said first position; a second drive means for moving said dog means from said first position to said second position, said dog means staying in either of said first or second positions until moved to the other of said first or second positions by said first or second drive means; drivable means attached to said trolley member for being moved between first and second positions by said first and second drive means; pivot means for pivotally attaching said drivable means to said trolley member; and linkage means for causing said dog means to move to said first position when said drivable means is moved to said first position and to move to said second position when said drivable means is moved to said second position; said linkage means including a first link member having a first end attached to said drivable means for pivotal movement therewith and having a second end, including a second link member having a first end pivotally attached to said dog means and having a second end, and including a pivot member for pivotally attaching said second ends of said first and second link members to one another, the axis of said pivot member being located on one side of the axis of said pivot means when said dog means is in said first position and being located on the other side of the axis of said pivot means when said dog means is in said second position.

4,389,945

TRANSVERSE GUIDE ROLLER ARRANGEMENT FOR A TRACK GUIDED VEHICLE

Friedrich Bährle, Kernen-Rommelshausen; Hellmuth Binder; Wolfram Meyer, both of Stuttgart, and Helmut Wulf, Ostfildern, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,101
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935386
Int. Cl.³ B61B *12/02*; B61F *9/00*
U.S. Cl. 104—247 **35 Claims**



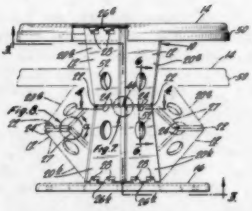
1. A transverse guide arrangement for a vehicle adapted to be mechanically guided along a guide track, the arrangement including at least one support arm means adapted to be mounted at a wheel of the vehicle, at least one transverse guide roller means having a rim and a hub, the hub being rotatably supported on a journal adapted to be attached to an end of the supporting arm means, means for enabling an exchangeable mounting of the journal to the supporting arm means, a rubber tire adapted to be mounted on the rim, characterized in that the hub and the rim are constructionally joined to form a hollow spool-shaped body which, with its interior side, forms the hub and, with its exterior side, forms the rim.

4,389,946

FOLDING FURNITURE PIECE

Sung T. Hwang, Flat 5, 4th Floor, 6 Tin Heung St., Kowloon, Hong Kong

Continuation of Ser. No. 900,193, Apr. 26, 1978, abandoned. This application Apr. 2, 1980, Ser. No. 136,516
Claims priority, application Taiwan, Nov. 15, 1977, 6623505
Int. Cl.³ A47B *3/00*
U.S. Cl. 108—115 **2 Claims**



1. A folding table, stool or like support device comprising a top, a base and collapsible column means interconnecting the top and the base, the column means comprising more than two articulated support elements each comprising a first member having two spaced side edges and being pivotally connected at an upper end to the top and a second member having two spaced side edges and being pivotally connected at a lower end to the base, the first and second members being hingedly interconnected for pivoting outwardly with respect to a central axis

extending through the top and the base to a collapsed position with the top adjacent the base and for pivoting inwardly with respect to the central axis to an over-center upright position in which the side edges of each articulated support element are in engagement over a major part, including at the hinge portion, of the length of the articulated support elements thereby to provide mutual support to maintain them in the upright position, wherein each member of each articulated support element has a beveled side edge and a side edge provided with a flange configured to mate with the beveled side edge of an adjacent member of an adjacent articulated support element, the flange on the first member being aligned with the flange on the second member of an adjacent articulated support element when the articulated support members are in the upright position and wherein the flange of the first member is provided adjacent its hinge connection with a downwardly extending projection and the flange of the second member of an adjacent articulated support element is provided adjacent its hinge connection with an upwardly extending projection, the projections being engageable when the articulated support elements are in the upright position and being resiliently deformable releasably to lock the articulated support elements in the upright position.

4,389,947

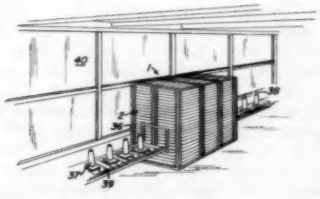
BLAST SUPPRESSIVE SHIELDING

Paul V. King, Joppatowne; Albert F. Becher, Fallston, and Wilmer P. Henderson, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 699,738, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 495,177, Aug. 6, 1974, abandoned. This application Sep. 24, 1979, Ser. No. 78,348

Int. Cl.³ F41H *5/00*

U.S. Cl. 109—1 S **5 Claims**



1. A blast hazard control system for the manufacture of hazardous items including munitions, explosives, propellants and pyrotechnics, comprising:

a building structure;

an assembly line in said structure for conveying and performing operations on said items; and

a blast suppressive shield enclosing at least one area of said assembly line in which hazardous operations are performed on said items,

wherein said blast suppressive shield comprises a multiplayer metal or metal-like composite which includes, in combination:

a first apertured plate in the form of a louvered plate suitable for slowing or confining blast debris and fragments;

a second apertured plate in the form of a perforated plate defining a plurality of gas flow apertures suitable for attenuating blast overpressure; and

means for mounting said first and second apertured plates in spaced apart and substantially fixed position relative to each other.

4,389,948

SECURITY ENCLOSURES

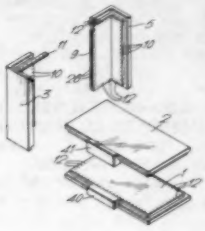
Raymond L. Sands, Solihull, and Geoffrey M. Ward, Wombourne, both of England, assignors to Chubb & Son's Lock and Safe Company Limited, London, England

Filed Jul. 17, 1981, Ser. No. 284,293

Claims priority, application United Kingdom, Jul. 18, 1980, 8023615

Int. Cl.³ E04B *2/02*

U.S. Cl. 109—82 **16 Claims**



1. A security enclosure constructed by assembling together in demountable fashion a plurality of separate, pre-fabricated panels, wherein each perpendicular corner of the assembled enclosure is provided in at least one panel which extends integrally from the respective corner to define significant portions of both of the adjacent sides of the enclosure, and wherein at least each such corner panel is provided with a penetration-resistant barrier consisting essentially of a fibre-reinforced concrete material.

4,389,949

METHOD OF AND ARRANGEMENT FOR SUPPLYING A FUEL TO A PLURALITY OF BURNERS OF A FURNACE

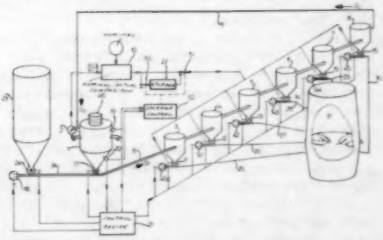
Dieter Heep, Bergatreute, Fed. Rep. of Germany, assignor to Waeschle Machinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,995

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042661

Int. Cl.³ F23K *3/02*

U.S. Cl. 110—101 CF **20 Claims**



1. A method of supplying a fuel to a plurality of burners of a heating installation, comprising the steps of providing a plurality of dosing elements arranged to individually dose a fuel to a plurality of burners and having an excessive available amount of the fuel; withdrawing from the dosing elements an unused amount of the fuel; determining a difference between the available amount and the nonused amount of the fuel to obtain an actual consumed amount of the fuel; comparing the thus obtained actual consumed amount of the fuel with a desired consumption amount of the fuel; and controlling the

dosing of the fuel to each of the burners in dependence upon the results of said comparing step.

5. An arrangement for supplying a fuel to a plurality of burners of a heating installation, comprising a plurality of dosing elements arranged to individually dose a fuel to a plurality of burners and having an excessive available amount of the fuel; means for withdrawing from said dosing elements a nonused amount of the fuel; means for determining a difference between the available amount and the nonused amount of the fuel to obtain an actual consumed amount of the fuel; and means for comparing the thus obtained actual consumed amount of the fuel with a desired consumption amount of the fuel and controlling the dosing of the fuel to each of the burners in dependence upon said comparison.

4,389,950

PROCESS FOR BURNING RETORTED OIL SHALE AND IMPROVED COMBUSTOR

Corey A. Bertelsen, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 246,555, Mar. 23, 1981, Pat. No. 4,336,126. This application Feb. 19, 1982, Ser. No. 349,957

Int. Cl.[3] B09B *3/00*; C10G *1/00*

U.S. Cl. 110—235 2 Claims

1. A combustion device for burning particulate retorted oil shale separated into a fine particulate feedstream and coarse particulate feedstream which comprises:

(a) a generally vertical main combustion chamber having an upper zone closed at the top, a middle zone, and a lower zone open at the bottom, said lower zone having means for pneumatically entraining solids entering said lower zone, said middle zone being an elongate tubular zone adapted for the combustion of entrained particulate solids, said upper zone being adapted for the disengagement of entrained coarse particles and for the collection and removal of the disengaged coarse particles, said upper zone further having an outlet for the removal of combustion gases and fine entrained particles;

(b) a generally vertical tubular fine solids combustion chamber adapted for burning pneumatically entrained fine solids, said fine solids combustion chamber having an open upper end communicating with the lower zone of the main combustion chamber, said fine solids combustion chamber further having a lower end having an inlet for the introduction of the fine particulate feedstream and means for pneumatically entraining the fine particulate material and conveying it the length of the fine solids combustion chamber;

(c) a coarse solids preburning chamber having an inlet for the introduction of the coarse particulate feedstream, means for fluidizing a burning bed of the coarse particulate material, and means for communication with the lower zone of the main combustion chamber.

4,389,951

MATERIAL DISPENSING MEANS FOR SEWING MACHINES

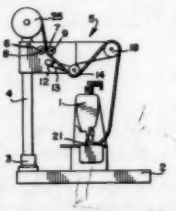
Wolf R. von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,773

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007652

Int. Cl.[3] D05B *23/00*

U.S. Cl. 112—121.27 11 Claims



1. In combination with a machine capable of having a strip-like material fed therethrough, a mechanism suited for use in supplying strip like material from a source thereof to said machine, said mechanism comprising:

means adapted to feed the strip-like material to said machine at a rate which is function of the machine speed;

means for automatically controlling the feed means in response to a control signal having a selective premeasurable value proportional to the speed of the machine; and

means responsive to variations in the speed of said machine and the feed rate of the feed means for controlling the amount of material being fed to the machine.

2. A device for automatically delivering tape from a supply roll to a sewing machine in accordance with the operational demands of the latter, comprising, in combination:

operative means responsive to the operative speed of the machine and arranged proximate thereto for withdrawing tape from the supply roll and delivering it to said machine;

means adapted to selectively control the withdrawal rate of the operative means as a function of machine speed; and

comparator means for varying the withdrawal rate of the operative means relative to the demands of the sewing machine as a function of the amount of tape between the withdrawing means and said sewing machine.

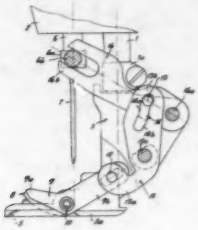
5. An apparatus suited for use in supplying tape from a source thereof to a machine, comprising:

tape dispensing means coupled to a closed loop control means, said closed loop control means including motor means for operating said tape dispensing means in response to machine speed, means coupled to said motor means for producing a command signal controlling the operation of the tape dispensing means, and comparator means which operatively measures the advance rate of the tape dispensing means against machine use requirements and effects the tape advancement as a resultant of that measurement.

4,389,952
NEEDLE BAR OPERATED TRIMMER

Ernst Dreier, Steckborn, Switzerland, and Richard Höss, Singen, Fed. Rep. of Germany, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Machmaschinenfabrik, Steckborn, Switzerland

Filed Jun. 25, 1981, Ser. No. 277,388
Claims priority, application Switzerland, Jun. 30, 1980, 5007/80
Int. Cl.³ D05B 65/02
U.S. Cl. 112—128 R **9 Claims**



1. An attachment for use with a sewing machine for cutting the edges of material, said sewing machine containing a needle bar and a presser bar, which comprises,

a fixed blade containing a cutting edge and a movable blade, said movable blade being driven by said needle bar of the sewing machine,

a holding means for mounting the fixed blade thereto, said holding means being, in turn, detachably mounted at one end to said presser bar of the sewing machine and provided at the other end thereof with a foot plate,

a presser foot sole operatively connected to said foot plate in a pendulating fashion and said movable blade being pivotable connected to said holding means, and

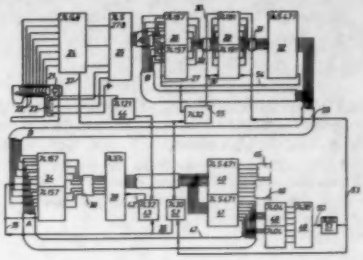
an intermediate articulated lever system supported by said holding means, said intermediate articulated lever system providing driving connection between the needle bar and the movable blade wherein said movable blade is a double-armed lever, one arm being provided with a cutting edge which cooperate with the cutting edge of the fixed blade to provide a scissor-like action and the other arm thereof being pivotally connected by slot means to said needle bar through said intermediate articulated lever system.

4,389,953
SEWING MACHINE FOR SEWING FANCY SEAMS

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna, Huskvarna, Sweden

PCT No. PCT/SE80/00173, § 371 Date Dec. 24, 1980, § 102(e) Date Dec. 24, 1980, PCT Pub. No. WO80/02851, PCT Pub. Date Dec. 24, 1980
PCT Filed Jun. 13, 1980, Ser. No. 227,043
Claims priority, application Sweden, Jun. 20, 1979, 7905423
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E **10 Claims**

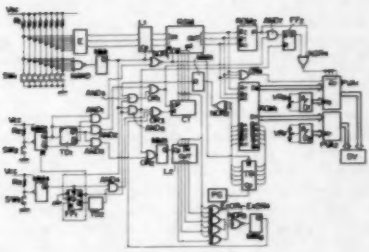
1. In a sewing machine for sewing fancy seams and including mechanisms for mechanically positioning the needle and/or a cloth feeder of the machine for every stitch and a memory unit controlling said mechanisms, wherein stitch code words representing at least one specific fancy seam are selected from said unit by means of a pattern selector and said code words are applied to the mechanism in synchronism with a pulse generator driven by the mechanical drive system of the machine, the improvememt wherein said memory unit comprises a stitch memory for storing stitch codes for groups of stitches which comprise seam elements, each said group including at least one stitch, said fancy seam comprising predetermined combinations of said seam elements, and comprising a seam instruction list for storing the seam instruction code of the predetermined combination of seam elements of the fancy seams and connected to successively apply start words for each of the seam elements to said stitch memory.



4,389,954
ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa, and Haruhiko Tanaka, Mitaka, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,209
Claims priority, application Japan, Oct. 31, 1980, 55/152265
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 E **1 Claim**



1. An electronic sewing machine comprising: a first memory storing stitch control data for different stitch patterns to be selectively produced, pattern selecting means including a number of pattern selecting switches which are selectively operated to produce a pattern signal designating the corresponding one of the patterns stored in the first memory, pattern memory control means operated to determine a combination of different patterns, a second memory operated in response to the operation of the pattern selecting means and of the pattern memory control means to memorize the combination of different patterns in a predetermined sequence, needle swing adjusting means operated to adjust the swinging amplitude of the needle with a common variation rate with respect to each of the stitch control data read out from the first memory in response to the designation of the pattern signals memorized in the second memory, a third memory storing basic needle position designating signals each specific to the patterns stored in the first memory, basic needle position control means operated in reponse to the operation of the pattern memory control means to memorize a specific one of the basic needle position designating signals of the third memory to control the stitches of the designated combined patterns with a common basic needle position, calculating means operated in response to the output signal of the basic needle control means, the stitch control signal of the first memory and the output signal of the needle swing adjusting means to adjust the swinging amplitude

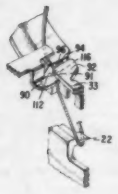
of the needle with a common variation rate with respect to each of the stitches of the combined patterns, and to set a common basic needle position for the patterns, and stitch forming means operated in response to the output of the calculating means to produce the stitches of the combined patterns.

4,389,955

THREAD HOLDING FINGER FOR BOBBIN WINDING MECHANISM OF A SEWING MACHINE

Robert H. Larsen, Middletown, N.J., and Anthony Giaimo, Staten Island, N.Y., assignors to The Singer Company, Stamford, Conn.

Filed May 20, 1981, Ser. No. 265,506
Int. Cl.³ D05B *59/00*
U.S. Cl. 112—184 **7 Claims**



1. In a lockstitch sewing machine, a cup-shaped circular moving looptaker including a peripheral rim formed with a thread seizing beak, a non-rotatable bobbin case supported in the looptaker, a rotatable bobbin within the bobbin case, an endwise reciprocable needle movable into a position for presenting a loop of needle thread to the looptaker beak for seizure, a thread tensioning device carried by the bobbin case and including an arm forming a thread entering slot for said device with a shoulder on the bobbin case, a finger disposable in a position wherein an end portion projects under the arm of the tensioning device and serves to guide a limb of a seized loop of needle thread into said slot thereby providing for the passage of the thread into the tensioning device, thread pick up means on the bobbin, and means for rotating the bobbin to cause the bobbin to pick up and wind thread extending through the tensioning device onto the bobbin, said finger having a thread engageable edge formed at least in part with a predetermined curvature extending to the said end portion of the finger and along which the movement of thread toward the slot is delayed to prevent the thread from leaving the finger at least until the thread is carried in said throat to a point which is substantially defined by the intersection of the path of thread on the looptaker beak and a line perpendicular to a radius extending from the looptaker axis to the finger.

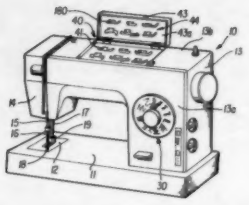
4,389,956

COLOR CODED PRESSER FOOT ASSEMBLY

Hideo Nawa, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 3,420, Jan. 15, 1979, abandoned. This application Nov. 26, 1980, Ser. No. 210,800
Claims priority, application Japan, Jan. 18, 1978, 53-4245
Int. Cl.³ D05B *29/12*
U.S. Cl. 112—240 **21 Claims**

1. A sewing machine comprising:
a bed including a throat plate;
an overhanging arm extending from said bed and terminating in a head;
a needle bar reciprocably positioned in said head;
a needle carried by said needle bar;
a presser bar movable vertically between a raised and depressed position in said head;
a pattern selecting mechanism operatively associated with said arm;
pattern indicating means operatively connected to said pattern selecting mechanism and representing a desired stitch pattern in shape and color;
presser means including a plurality of presser foot members each being detachably mountable to said presser bar directly rearwardly of said needle in accordance with said color wherein each of said plurality of presser foot members has a color indication means thereon corresponding to one of the colors of said pattern indicating means for indication of stitch pattern, and wherein said pattern indication means further comprises:
a shaft rotatably passed through a front side of said arm;



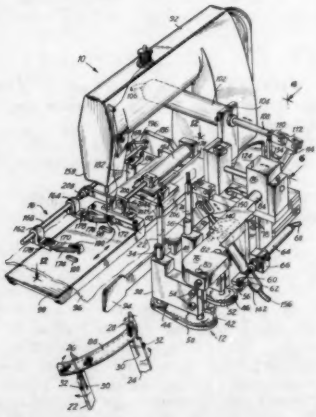
a dial connected to one end portion of said shaft at a front position of said arm for rotating said shaft;
a first disc rotatable together with said shaft;
a plurality of representations for indicating a desired stitch pattern by shapes provided on said first disc on the circumference thereof;
a plurality of color sectors corresponding to said representations for indicating a desired stitch pattern by colors provided on said first disc on the circumference thereof; and
marking means for pointing out one of said color sectors.

4,389,957

BELT LOOP SETTING SYSTEM

Charles Block, North Bellmore, and Leon Mintz, Syosset, both of N.Y., assignors to Joseph Galkin Corporation, Hicksville, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,790
Int. Cl.³ D05B *3/12, 23/00, 97/00*
U.S. Cl. 112—262.3 **2 Claims**



1. A loop setting system comprising, in combination: a first pair of pin members extending substantially in a first direction a predetermined distance from a first reference axis, a second pair of pin members spaced from said first pair of pin members

and extending substantially parallel with respect to said first direction a predetermined distance from a second reference axis, said first and second pairs of pin members each defining respective first and second slots therebetween capable of receiving therein relatively remote portions of material to be manipulated to form a folded configuration capable of joinder with other material, means for arcuately moving said first and second pairs of pin members about said respective first and second axes, thereby accomplishing said folding manipulation and positioning the formed configuration with respect to a reference plane, said first pair of pin members being disposed such that all points along a line joining said first pair of pin members are spaced a pre-determined distance from said first axis, said system further comprising means for arcuately moving said pin members about an axis substantially perpendicular with respect to said first axis to a joining position, means for withdrawing said pin members from the material prior to a step of joining, means for joining said material to other material, and means for causing a return of said pin members to their original position.

2. A method of repeatedly forming loop-like configurations incorporating lengths of material such as, without limitation, folded belt loop segments to be joined to apparel, or the like, comprising the steps of: receiving relatively remote portions of a length of material within a pair of first and second spaced pairs of pin members, rotating said first and second pairs of pin members about first and second axes which are, respectively, disposed a pre-determined distance from all points along a line joining respective pin members of each said pin, said step of rotating causing a folding of at least one end of said material backwardly upon itself, said method further comprising the steps of arcuately moving said pin members about an axis substantially perpendicular with respect to said first axis to a joining position, withdrawing said pin members from the material prior to a step of joining, joining said material to other material, and causing a return of said pin members to their original position.

4,389,958

HULL FOR MULTIHULLED SAILING VESSELS

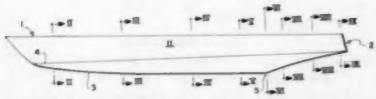
Rodney C. March, P.O. 57 The Leas, Minister, Isle of Sheppey, Kent, England

Continuation-in-part of Ser. No. 13,692, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 862,547, Dec. 20, 1977, abandoned, which is a continuation of Ser. No. 719,517, Sep. 1, 1976, abandoned. This application Apr. 2, 1980, Ser. No. 136,480

Claims priority, application United Kingdom, Sep. 3, 1975, 36236/75

Int. Cl.³ B63B *3/00*

U.S. Cl. 114—39 **8 Claims**



1. A multihulled sailing vessel, at least one hull of said vessel comprising a shallow draft hull form characterized by,

A. a keel line profile configuration having a discontinuity abaft midships and wherein said keel line profile is convex relative to the design waterline from the forward intersection of said design waterline and said keel line profile to said discontinuity and wherein said keel line profile is substantially straight or concave relative to the design waterline from said discontinuity aft to the after intersection of said design waterline and said keel line profile;

B. said discontinuity being not less than 90 percent of the deepest point of draft relative to said design waterline of said hull, excluding appendages;

C. station sections forward of said discontinuity having a substantially veed form and station sections aft of said discontinuity having a substantially semicircular or U-form;

D. said hull providing sufficient lateral hydrodynamic lift to provide good windward performance without reliance upon hydrodynamic fins or appendages;

E. said hull form being adapted to generate a high hydrodynamic lift-to-drag ratio and high hydrodynamic lift when operating at leeway angles greater than zero and up to about eight degrees, and low drag when operating at leeway angles of substantially zero;

whereby said vessel is capable of performance at speed-length ratios greater than 1.5.

4,389,959

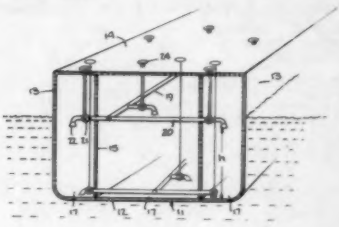
CARGO HANDLING SYSTEM FOR TANKER VESSELS

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Continuation-in-part of Ser. No. 913,956, Jun. 9, 1978, Pat. No. 4,241,683, which is a continuation-in-part of Ser. No. 809,395, Jun. 23, 1977, abandoned. This application Aug. 21, 1980, Ser. No. 180,046

Int. Cl.³ B63B *25/12*

U.S. Cl. 114—74 R **8 Claims**



1. In a tanker vessel for carrying a plurality of liquid cargoes each having a specific gravity which is less than that of sea water, said vessel including a hull comprising a bottom and sides, a top deck, at least one cargo compartment disposed between said top deck and said hull bottom for storing said liquid cargo, and main liquid cargo charging and discharging means coupled to said cargo compartment for charging and discharging said cargo compartment, the improvement comprising additional liquid cargo charging and discharging means coupled to said cargo compartment, said additional liquid cargo charging and discharging means including pipe means longitudinally disposed in said vessel, transversely disposed valved branch line means coupled to said pipe means, said branch line means including a suction opening disposed in and opening into said cargo compartment at a distance above said hull bottom which is approximately equal to $H(S_w/S_c)-0.10H$, where H represents the distance from the bottom of said vessel to its waterline, S_w represents the specific gravity of sea water, and S_c represents the specific gravity of the heaviest liquid cargo which said vessel is adapted to carry.

4,389,960

BARGE

Edwin H. Fletcher, Marathon, Fla., assignor to Transway International Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,664

Int. Cl.³ B63B *21/56*

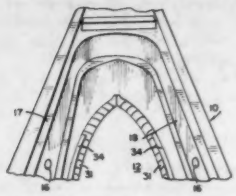
U.S. Cl. 114—248 **4 Claims**

1. A barge comprising:

a barge bottom and a deck mounted on the barge bottom, said barge bottom and deck at the stern of the barge, including a well open at its bottom and rear for receiving the bow of a craft for pushing the barge; and

a flexible sealing means having one end connected to the

barge bottom below the water line and the other end free for movement into sealing engagement with a craft for propelling the barge, said flexible sealing means being positioned around the perimeter of the well and extending over a substantial portion thereof, said flexible sealing means extending rearwardly into the well a distance



whereby the well bottom is open in the absence of a craft and whereby said flexible sealing means is maintained in sealing engagement with the bow portion of a craft received in the well during propulsion of the barge by the craft to define with the craft a closure for the bottom of the well to thereby reduce water resistance during propulsion.

4,389,961

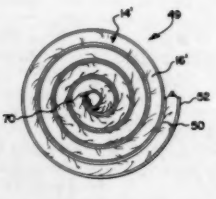
SELF-COLLAPSIBLE, INFLATABLE DEVICE

John R. Parish, 2543 Evermur Dr., Dayton, Ohio 45414

Filed Dec. 15, 1980, Ser. No. 216,408

Int. Cl.³ B63B *7/08*

U.S. Cl. 114—345 **12 Claims**



1. A self-collapsible, inflatable device comprising:

a sheet made of a thermoplastic material having a memory set such that it forms into a coil when unrestrained;

at least one inflatable member, semi-rigid when inflated and becoming flaccid and capable of being coiled when deflated, said inflatable member including valve means which may be opened for selectively allowing the entrance or egress of a gas or a fluid to inflate or deflate said inflatable member;

means for attaching said inflatable member to said sheet such that inflation of said inflatable member is sufficient to overcome said memory set and force said sheet and said inflatable member to assume a substantially uncoiled position and deflation of said inflatable member permits said memory set to cause said sheet and said inflatable member to assume a coiled position; and

said memory set being sufficient to promote deflation of said inflatable member when said valve means is opened.

4,389,962

OPTICAL DISPLAY UNIT FOR PNEUMATIC SYSTEMS

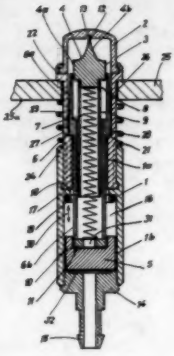
Kurt Stoll, Lenzhalde 72, 73 Esslingen/N., Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 246,964

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012265

Int. Cl.³ G01D *5/28;* **G01L** *19/12;* **G08B** *5/18*

U.S. Cl. 116—272 **13 Claims**



1. In an optical display unit having a fixed mirror part visible to the outside of said unit and a sleeve means movable in relation to said mirror part for altering the appearance of said mirror part by selectively cutting off light therefrom when said unit is acted upon by an input pressure signal, said unit comprising a hollow guide stem having a transparent cover through which said mirror part is made visible to an observer of said display unit, a fixed inner part to which said mirror part is secured, said sleeve means including a sleeve, a piston movably mounted in said hollow guide stem for movement backwards and forwards in said guide stem, the improvement comprising wherein said guide stem is composed of two halves and includes connecting means for facilitating a connection to one another, one half terminating at said transparent cover and the other half terminating at an end wall having a pipe connection thereon for facilitating a connection of the pressure signal to a space whose pressure condition is to be monitored and displayed, whereby said piston is driven upwardly in response to said input pressure signal, and wherein said piston is reciprocally mounted in said other half between said end wall and a stop means intermediate said one half and said end wall, said piston further being free of a fixed connection to said sleeve but drivingly joined to said sleeve to facilitate assembly.

4,389,963

APPARATUS AND METHOD FOR MONITORING PERIODIC DISPENSATION OF PILLS

Richard W. Pearson, Ridge Rd., Chester, Conn. 06412

Filed Mar. 26, 1981, Ser. No. 247,806

Int. Cl.³ A61J *7/00;* **G09F** *7/18*

U.S. Cl. 116—308 **8 Claims**

1. Apparatus for monitoring the periodic dispensation of a plurality of articles contained in vessels, comprising a receptacle for receiving said vessels introduced along a vertical axis, the receptacle having sides and being adapted for selective rotation manually about the vertical axis, said sides having at least two designations of different time periods corresponding with the desired time of periodic dispensation of articles, the designations spaced apart so that by selective rotation of the receptacle only one of said designations may be made principally viewable from a lateral position for enabling periodic dispensation of articles, and said vessels contained within the receptacle, the vessels holding articles to be dispensed at one of

the designated time periods on the side of the receptacle the vessels having individual marking tags which are different

from each other, said individual marking tags also being affixed to the sides of the receptacle at the locations where the time designations appear.

4,389,964

APPARATUS FOR APPLYING A PROTECTIVE COATING TO THE SEAM OF WELDED CAN SLEEVES

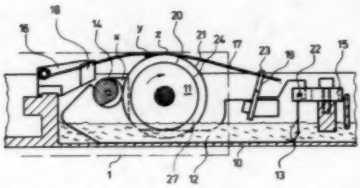
Siegfried Frei, St. Gallen, Switzerland, assignor to Frei AG Maschinenbau, Wittenbach, Switzerland

Filed Nov. 17, 1981, Ser. No. 322,235

Claims priority, application Switzerland, Dec. 3, 1980, 8916/80; May 6, 1981, 2942/81

Int. Cl.³ B05C *1/02, 7/08*

U.S. Cl. 118—66 **16 Claims**



1. In an apparatus for applying a protective substance to a welding seam of a metallic sleeve, including a frame, a container disposed within said frame holding a protective substance, a drivable applicator roller disposed in said container at least in part contact with said protective substance and applying the protective substance to the seam of said metallic sleeve within a substance transfer region, and wherein said sleeve moves towards, past and away from said applicator roller.

comprising in combination therewith

stripping means disposed within said transfer region abutting the periphery of said applicator roller and adapted for removing any excess substance leaking away laterally from said seam.

4,389,965

TENSION WIRE METER FOR IMPREGNATING FOAM WITH LIQUID FABRIC CONDITIONER

Rolf E. Christensen, Wallingford, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 788,778, Apr. 19, 1977, Pat. No. 4,109,035. This application Feb. 27, 1978, Ser. No. 881,245

Int. Cl.³ B05C *1/06, 1/08, 11/02*

U.S. Cl. 118—261 **6 Claims**

1. An apparatus for applying a liquid to a substrate comprising:

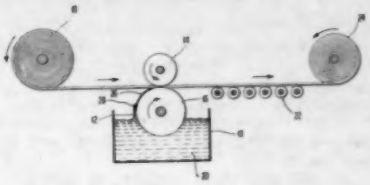
a first rotatable cylinder;

a second rotatable cylinder positioned below the first cylinder to form a nip between the first cylinder and the second cylinder;

means for feeding the substrate to the nip;

means for applying a quantity of the liquid onto said lower cylinder said quantity including an excess portion;

a tension wire doctor cooperating with the second cylinder



for forming a film of the liquid on the second cylinder and for removing said excess portion from said second cylinder; and

means for removing said substrate from said nip.

4,389,966

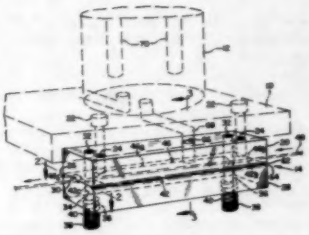
APPARATUS FOR APPLYING HOT-MELT TO THREAD

John L. Getz, Blachly, Oreg., assignor to Industrial Adhesive, Inc., Eugene, Oreg.

Filed Dec. 14, 1981, Ser. No. 330,372

Int. Cl.³ B05C *3/12*

U.S. Cl. 118—405 **8 Claims**



1. A device for heating an elongate string by reason of the string moving through a heated pool of liquid comprising:

a plate assembly including first and second heat-conductive elongate plates, each having a contacting face extending therealong, and means mounting the plates with their contacting faces abutting and opposite each other;

a channel extending along the contacting face of the first plate and another channel extending along the contacting face of the second plate, said channels being opposite and opening to each other and together defining a string-receiving passage extending between the plates with ends of the passage opening to opposite extremities of the plate, said passage being bounded on opposite sides by said contacting faces,

the means mounting the plates including biasing means yieldably maintaining said contacting faces in pressure contact and accommodating relative movement of the plates away from each other whereby their contacting faces spread apart,

a beveled entry formed in at least one plate leading to the abutting faces of the plates

said channels between their ends having elongate expanses with cross-sectional areas substantially greater than the cross-sectional area of the remainder of the channels, said expanses being opposite and in complementary registration with each other and together forming an elongate chamber for holding a heated pool of liquid which chamber is closed on opposite sides by reason of said contacting faces being resiliently held in pressure contact, and

heater means for applying heat to at least one plate which is effective to heat the pool of liquid inside the chamber by reason of the heat conductive nature of the plates and the pressure contact of said faces.

4,389,967

BOAT FOR CARRYING SEMICONDUCTOR SUBSTRATES

Haruo Shimoda, Tama, and Kaoru Tanabe, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

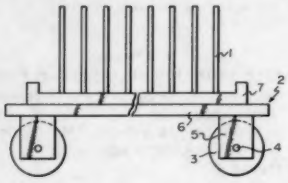
PCT No. PCT/JP80/00099, § 371 Date Jan. 11, 1981, § 102(e) Date Dec. 31, 1980, PCT Pub. No. WO80/02622, PCT Pub. Date Nov. 27, 1980

PCT Filed May 9, 1980, Ser. No. 227,075

Claims priority, application Japan, May 11, 1979, 54-62674

Int. Cl.³ B61B *13/00*

U.S. Cl. 118—500 **8 Claims**



1. A boat for carrying semiconductor substrates, comprising:
holding means for holding the semiconductor substrates thereon;
an axle;
bearing means for bearing the axle, said bearing means being fixed to said holding means and including a bearing portion through which said axle rotatably extends;
a wheel fixed to said axle; and
a silicon nitride film formed on the surface of at least one of said axle and said bearing portion,
wherein the holding means, wheel, axle and bearing means of said boat are made from the group consisting of quartz and polycrystalline silicon.

4. A system for carrying semiconductor substrates during high-temperature processing in a tube, comprising:
a support;
a plurality of wheels;
means mounting the wheels for rolling the support within the tube, said means being made substantially from the group consisting of quartz and polycrystalline silicon; and
silicon nitride separating the sliding surfaces within the means mounting the wheels.

4,389,968

TONER REGENERATING DEVICE

Hiroshi Satomura, Hatogaya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

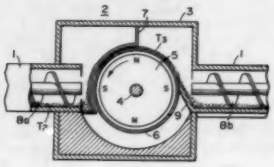
Filed May 19, 1981, Ser. No. 265,164

Claims priority, application Japan, May 26, 1980, 55-69841; Oct. 30, 1980, 55-152760

Int. Cl.³ G03G *21/00*

U.S. Cl. 118—652 **13 Claims**

1. A toner regenerating device comprising:
cleaning means for removing magnetic toner remaining on an image bearing body;
a mesh member;
means for guiding and supplying the toner removed by said cleaning means to said mesh member;
magnetic field imparting means provided adjacent to said mesh member at a location opposite to the side where toner is supplied by said guiding and supplying means;
non-magnetic toner carrying means provided between said magnetic field imparting means and said mesh member for bearing the toner which passes through said mesh member; and
collecting means for collecting the toner born on said carrying means;
wherein said carrying means and magnetic field imparting means are relatively movable to carry onto and along said



mesh member only a certain amount of the toner in accordance with the magnetic force imparted by said magnetic field imparting means from the total amount of the toner supplied by said cleaning means so that non-magnetic components are separated from the supplied toner and toner from which the non-magnetic components have been removed is born on said carrying means and collected.

4,389,969

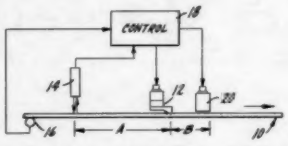
GLUE DETECTOR

Keith R. Johnson, Orland Park, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

Filed Jun. 22, 1981, Ser. No. 275,997

Int. Cl.³ B05C *5/02, 11/00*

U.S. Cl. 118—665 **8 Claims**



1. Means for detecting the application of glue to a defined area of a moving box blank including a capacitance device, one plate of which is formed by a sensing surface positioned adjacent the path of box blank movement, said sensing plate including a guard element, electrically isolated from said sensing plate, the other plate of said capacitance device being formed by the defined area of the box blank and the applied glue, means for applying an electrical signal to said sensing surface and guard element, with the signal applied to the guard element eliminating the effects of stray circuit capacitance on variations in said signal, and means for sensing variations in said signal caused by the presence or absence of glue.

4,389,970

APPARATUS FOR REGULATING SUBSTRATE TEMPERATURE IN A CONTINUOUS PLASMA DEPOSITION PROCESS

Robert F. Edgerton, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 16, 1981, Ser. No. 244,389

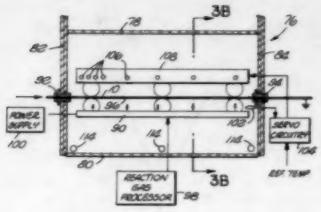
Int. Cl.³ C23C *13/10*

U.S. Cl. 118—666 **4 Claims**

1. Apparatus for heating a continuous substrate to a predetermined deposition temperature as it travels through at least one glow discharge chamber, said apparatus comprising:
a heater, said heater including a plurality of heater lamps within said glow discharge chamber spaced along the direction of travel of said substrate, the spacing between adjacent lamps increasing along said direction of travel so

that the temperature of said continuous substrate is rapidly heated to and maintained at said predetermined deposition temperature as it travels through said chamber;

a detector for monitoring the temperature of said substrate, said detector including means responsive to infrared radiation of about 5 microns in wavelength; and



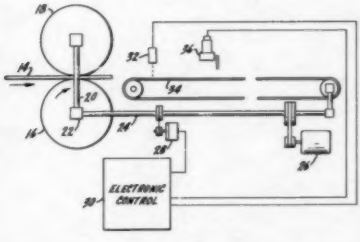
a feedback control circuit coupled to said detector for adjusting the intensity of said lamps in response to the temperature of said substrate, said circuit being responsive to the output of said detector to produce a signal to control the intensity of each of said lamps.

4,389,971

MEANS FOR CONTROLLING THE APPLICATION OF GLUE TO A DEFINED AREA

Robert W. Schmidt, Oak Lawn, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

Filed Apr. 16, 1979, Ser. No. 30,469
Int. Cl.³ B05C 5/00
U.S. Cl. 118—669 **2 Claims**



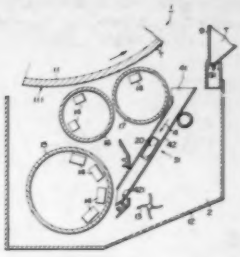
1. A control for regulating the application of glue to a defined area of a moving paper board box blank including a sensor for detecting the presence of the leading and trailing edges of a moving defined glue application area, a glue applicator spaced a fixed distance from the sensor, means for generating electrical pulses representing length of travel of the glue application area, a first counter connected to said pulse generating means, sensor and glue applicator, a second counter connected to said pulse generating means, sensor and glue applicator, said sensor initiating a counting action in said first counter at detection of the leading edge of a glue application area, said first counter initiating a glue application after a predetermined number of counted pulses representative of movement of the application area through said fixed sensor to glue applicator distance, said sensor initiating a second counting action in said second counter at detection of the trailing edge of a glue application area, said second counter stopping glue application after a predetermined number of counted pulses representative of movement of the application area through said fixed sensor to glue applicator distance.

4,389,972

TONER CONCENTRATION CONTROL APPARATUS

Koji Hirakura, Yokohama; Yasuo Sawada, Sayama; Kenta Watase, Tokyo, and Takeshi Iijima, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 25, 1980, Ser. No. 172,240
Claims priority, application Japan, Aug. 4, 1979, 54-99635; Nov. 14, 1979, 54-147545
Int. Cl.³ B05C 19/00; G03G 15/09
U.S. Cl. 118—691 **4 Claims**



1. A toner concentration control apparatus for controlling the concentration of toner in developer comprising at least toner and carrier particles of different reflectivities for use in electrophotographic copying apparatus comprising:

chute means capable of causing the passage of developer in a packed state therethrough;

a viewing window of transparent material disposed within a portion of the body of the chute means;

a light source;

photosensing means, a first portion of which is capable of sensing light reflected by the developer as it passes the viewing window in the chute means and is illuminated by the light source and producing a first signal corresponding to the value of said reflected light, and a second portion of which is capable of sensing a reference light from the light source and producing a second signal corresponding to the value of said reference light;

rigid support means attachable to or integral with the chute means capable of supporting and enclosing the light source and the photosensing means at a predetermined position in the vicinity of the viewing window, and forming a multi-channel light path for the light from the light source therein, which light path and the light source and photosensing means and external surface of the viewing window are substantially sealed from the surrounding environment by said support means including at all points of contact between said support means and chute member;

comparator means for comparing said first and second signals produced by the photosensing means and producing an output signal;

decision means for evaluating the output signal of the comparator in comparison with a predetermined reference indicating the desired toner concentration and producing a decision signal;

dispensing means capable of dispensing toner into the developer supply; and

drive means for activating and deactivating said dispensing means in accordance with the decision signal of the decision means;

wherein said first portion of said photosensing means and said second portion of said photosensing means are independently sensitive portions of a single photosensor;

said single photosensor being positioned so as to receive the light beam reflected by said developer and the light beam from said reference light;

which said two light beams follow separate optical paths so as to strike said respective portions;

and said apparatus includes reflector means to reflect the light beam of said reference light to said second portion of said single photosensor.

4,389,973

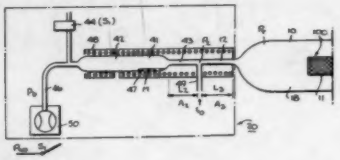
APPARATUS FOR PERFORMING GROWTH OF COMPOUND THIN FILMS

Tuomo S. Suntola; Arto J. Pakkala, and Sven G. Lindfors, all of Espoo, Finland, assignors to Oy Lohja AB, Virkkala, Finland

Continuation of Ser. No. 131,496, Mar. 18, 1980, abandoned, which is a division of Ser. No. 50,606, Jun. 21, 1979. This application Dec. 11, 1981, Ser. No. 330,014

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—725 **2 Claims**



1. Apparatus for growing a compound thin film of different elements on a stationary substrate surface, wherein said film is formed by alternate surface reactions of different substances respectively containing said different elements, comprising:

a single chamber for receiving a substrate;

vacuum means coupled to said chamber;

heating means for heating the substrate within said chamber;

a plurality of vapor sources having outputs coupled to said chamber for separately supplying vapors of said different substances from said vapor sources to said chamber;

a gas phase medium including a source of gas coupled to said chamber and to each of said vapor source outputs; and

means for controlling a flow of said gas phase medium through said chamber from said gas source to said vacuum means, for supplying said gas phase medium at least at the conclusion of the separate supply of one of said vapors and prior to the separate supply of another said vapor, and for selectively controlling a flow of said gas phase medium at said source outputs to direct said medium in an upstream direction to said vapor sources, for alternately stopping the supply of vapor from said sources, for alternately stopping the supply of vapor from said sources, and to direct said medium in a downstream direction toward said chamber to isolate each said source from the other, wherein said chamber is substantially cleared of said vapors between each said alternate surface reaction in the growing of said compound thin film on said substrate, and wherein self-saturating surface reactions thereby occur during each separate supply of a vapor source, and said supply of gas prevents reactions between said sources as said compound film of different elements is grown on said substrate surface.

4,389,974

APPARATUS AND METHOD FOR REARING SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 925,793, Jul. 18, 1978, Pat. No. 4,249,480. This application Oct. 21, 1980, Ser. No. 199,237

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—2 **2 Claims**

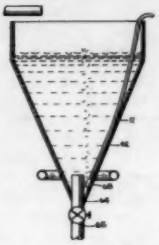
1. An Artemia tank for use in rearing Artemia comprising:

an upper portion;

a bottom conical portion extending from said upper portion and having an aperture at its apex;

means for draining said tank, said draining means including conduit means disposed in said bottom portion and extending upwardly from around said aperture;

debris collecting means formed by the outer surface of said conduit means and the inner sidewall of said bottom portion adjacent said conduit means; and



an annular light source positioned exteriorly to said bottom portion in surrounding relationship to the region of said bottom portion above said debris collecting means, said region being formed of a light transmissive material so as to permit passage of light from said light source into the portion of the interior of the tank surrounded by said region.

4,389,975

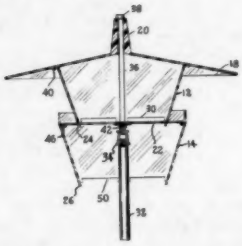
DUAL PURPOSE BIRD FEEDER

James B. Fisher, Jr., 2 Graybridge La., St. Louis, Mo. 63124

Continuation-in-part of Ser. No. 110,459, Jan. 8, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 218,621

Int. Cl.³ A01K *39/01*

U.S. Cl. 119—51 R **11 Claims**

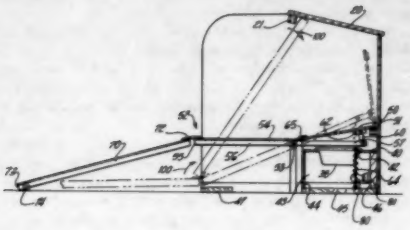


1. A bird feeder comprising a feeder housing supported upon a base tray having a peripheral portion extending beyond a bottom portion of said housing means for connecting said housing to a vertical support post and a squirrel barrier baffle member connected to an outermost peripheral portion of said tray and extending downwardly in spaced relation to said post, said baffle member extending downwardly a sufficient distance and being spaced from said post a sufficient distance to prevent a post climbing squirrel from reaching said tray, said baffle member being comprised of a downwardly tapering hollow inverted frusto-conical member, said frusto-conical member extending from a reduced diameter bottom edge spaced from said post to an enlarged diameter upper edge underlying the outer periphery of said tray to provide a sufficient outward and upward slope to prevent a squirrel from climbing thereon, said feeder housing comprising a hollow inverted frusto-conical member interchangeable with the baffle member.

4,389,976
ANIMAL FEEDING APPARATUS

Thaddeus Novak, 5037 Curtis, Dearborn, Mich. 48126

Filed Apr. 24, 1981, Ser. No. 257,494
Int. Cl.³ A01K 5/00
U.S. Cl. 119—62 13 Claims



1. An animal feeding apparatus for holding and protecting bowls of food comprising:

a housing having two side walls, a back wall and a top wall extending from said back wall;

a shelf and means for stationarily securing said shelf adjacent said back wall and under said top wall, said shelf including means for supporting at least one food bowl in said shelf;

a cover overlying said shelf;

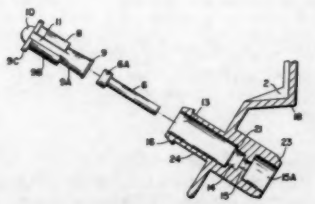
means for pivoting said cover between a first position in which said cover overlays said shelf and a second position in which said cover is spaced apart from and thus exposes said shelf; and

treadle means for actuating said pivoting means, said treadle means comprising a floor panel pivotally secured about an axis substantially at the end of said panel, a flat ramp and hinge means for securing an end of said ramp to an end of said floor panel so that upon depression of said treadle means said ramp moves from a first inclined position extending outwardly from the housing to a second depressed position thereby moving said end of said ramp towards said housing, said ramp being manually pivotable about said hinge means to a third position substantially within said housing.

4,389,977
WATERING VALVE-BRACKET FOR RABBITS AND SMALL FUR BEARING ANIMALS

Josef Borak, 34985 Hallert Rd., Matsqui, B.C. V0X 1S0, Canada

Filed Aug. 5, 1981, Ser. No. 290,327
Int. Cl.³ A01K 7/06; F16K 1/12
U.S. Cl. 119—72.5 6 Claims



1. A watering valve-bracket comprising

a valve body including a first cavity and an opening and a valve hanger bracket, said valve bracket and said valve body being formed as one piece,

said valve body including a first and a second internal shoulder,

said first shoulder providing a mounting seat for an enlarged head portion of an actuating pin located at a bottom portion of the valve body and extending through said opening, a flexible retainer plug adapted to substantially fit inside said first cavity having a top end and a bottom end and including a first and a second portion, said first portion being substantially uniform in diameter, said second portion having a generally conical shape, said second portion having a first diameter less than said diameter of said first portion and extending away from said first portion to an enlarged flexible base portion having a second diameter larger than said first diameter,

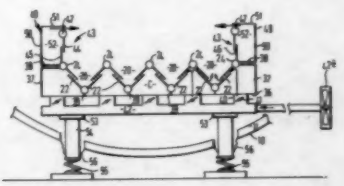
said retainer plug sized to frictionally engage the inside walls of said first cavity and said enlarged base portion engaging said second shoulder spaced above said first shoulder in a top portion of said valve body, said retainer plug further including at least one fluid passage extending axially along the circumferential surface of said top end,

whereby when an upward force is applied against said pin, said pin engages and unseats said base portion allowing fluid flow through said at least one fluid passage.

4,389,978
GRATES

Reginald D. Northcote, Lower Penn, England, assignor to Parkinson Cowan GWB Limited, Dudley, England

Filed Jun. 9, 1981, Ser. No. 272,035
Claims priority, application United Kingdom, Jun. 10, 1980, 8019015
Int. Cl.³ F22B 1/00
U.S. Cl. 122—4 D 13 Claims



1. A grate having a fuel supporting and conveying surface comprising a plurality of elongate longitudinally-oriented channels, each of said channels having an open mouth and a bottom and being longitudinally stepless and having a transverse cross-section which decreases in width in a direction extending away from the open mouth towards the bottom of the channel, said channels being arranged side-by-side transversely of the grate, a plurality of air feed openings each being provided to permit the interior of a respective one of the channels, in use, to be fed with air from an air supply at least in the region of the bottom of that channel, a plurality of adjustment means each being provided to permit adjustment of a respective one of said air feed openings to adjust the air supply transversely of the grate across the entire width of the grate, and means mounting said channels being provided to permit said channels to be vibrated, in use, to cause fuel to be conveyed along one or more of said channels and longitudinally of the grate, wherein the grate is provided in a shell-type boiler comprising an outer shell within which is contained a steam water space of the boiler and a furnace, said grate being provided within said furnace to fire the furnace, and said broiler having an apparatus for feeding solid fuel onto the grate.

4. A water cooled grate having a fuel supporting and conveying surface comprising a plurality of elongate longitudinally-oriented channels, each of said channels including upper water cooling pipes, a lower water cooling pipe which forms a base part of the channel and a pair of spaced apart side walls connected at their lower ends to said base part and connected at their upper ends to a respective one of said upper pipes, the walls of each channel being provided with a plurality of air feed perforations, each said channel having an open mouth and a bottom and being longitudinally stepless, said channels being

arranged side-by-side transversely of the grate; a plurality of air feed chambers each having a peripheral wall disposed beneath the side walls of the respective channels, at least one air feed opening provided in each peripheral wall to permit the interior of each channel, in use, to be fed with air from an air supply in the region of the bottom of that channel; a plurality of adjustment means each being provided to permit adjustment of a respective one of said air feed openings to adjust the air supply transversely of the grate across the entire width of the grate; baffle means being provided in each chamber and extending transversely to said at least one air feed opening to prevent egress of fuel through each such air feed opening; and means mounting said channels being provided to permit said channels to be vibrated, in use, to cause fuel to be conveyed along one or more of said channels and longitudinally of the grate.

4,389,979

METHOD AND APPARATUS FOR THE OPERATION OF A BOILER INSTALLATION WITH STOKER FIRING

Oddmund Saxlund, Heidberg 1, D-3040 Soltau-Harber, Fed. Rep. of Germany

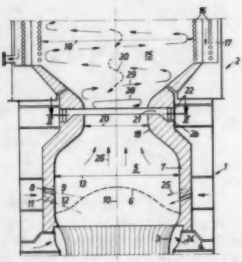
PCT No. PCT/DE80/00127, § 371 Date May 1, 1981, § 102(e) Date May 1, 1981

PCT Filed Sep. 3, 1980, Ser. No. 261,191

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1979, 2935494

Int. Cl.³ F23G 7/00; F22B 5/00

U.S. Cl. 122—15 **11 Claims**



1. A method for the operation of a boiler installation with stoker firing having a stoker chamber with a burner grating for supporting combustion material and for the passage of the primary air, introducing secondary air through nozzles distributed over the periphery, and a tubular boiler placed coaxially adjacent to the stoker chamber with an approximately circular inner chamber having pipe means associating therewith and annular gas extraction means, said method comprising the steps of:

supplying the stoker chamber with primary and secondary air sufficient only for a partial combustion of said combustion material and producing a mixture of combustion gases and unburned gases ascending in said stoker chamber;

substantially reducing the cross-section of the flow from said stoker chamber of said combustion gases and unburned gases to provide a nozzle-like constricted flow as said gases are discharging from the stoker chamber into the boiler chamber and to generate a pressure at said constricted flow reduced with respect to the ambient pressure;

introducing tertiary air sufficient for complete combustion tangentially at the narrowest point of the constricted flow at a pressure increased with regard to the ambient pressure;

rotating the flow of the combustion gases and unburned gases discharging from the stoker chamber and mixing said discharging gases with said tertiary air;

initiating after-burning of the unburned gases at the narrowest point of the constricted flow;

substantially increasing the cross-section of the entire flow again by flaring the rotating flow outwardly upon its entry into said boiler chamber;

directing the rotating flow upwardly toward the ceiling of the boiler chamber and transferring heat from combustion gases to said pipe means;

annularly extracting part of the upwardly flowing gases by means of said boiler extraction means;

redirecting part of the flow downwardly back toward the constriction from the ceiling of the boiler in a central core-type current flow to re-mix with the gases flowing upwardly from the constriction;

whereby complete combustion occurs in said boiler chamber and partial combustion occurs in said stoker chamber.

3. A combustion apparatus comprising a stoker chamber with a burner grating for supporting combustion material and primary air ducts associated with the grating for the supply of fresh air, air supply nozzles distributed over the periphery of said stoker chamber for the supply of secondary air;

said primary air ducts and secondary air supply nozzles being controlled to provide less than sufficient air for complete combustion in the stoker chamber whereby during operation both combusted and uncombusted gases ascend in said stoker chamber;

a tubular boiler placed coaxially adjacent to the stoker chamber having an inner chamber with upper ceiling means, and annular gas extraction means;

means connecting the stoker chamber to the inner chamber of the boiler forming a nozzle-like constriction for receiving said ascending gases;

said tubular boiler flaring outwardly from said constriction; and

a generally annular system to provide a tangential supply of pressurized tertiary air, sufficient for complete combustion, into said apparatus at the narrowest point of said nozzle-like constriction and being capable of placing ascending gases from said stoker chamber into rotation at said constriction and facilitate mixing with said tertiary air whereby after-burning of uncombusted gases initiates at said nozzle-like constriction and continues upwardly therefrom into said boiler inner chamber, and whereby said rotating gases flare outwardly and move upwardly from said constriction toward the ceiling means;

said annular system and boiler inner chamber being cooperative to facilitate flowing said rotating gases upwardly toward said ceiling means wherein a part of said upward flow is redirected at said ceiling means in a central downward core-type flow back toward said constriction to meet ascending gases from said stoker chamber and wherein part of said upwardly flowing gases is extracted at said extraction means;

pipe means associated with said boiler inner chamber capable of being heated by combusted gases; and,

wherein complete burning of combustion gases is obtained in the boiler and part of the combustion occurs in the stoker chamber whereby said stoker chamber receives a reduced thermal charge permitting temperatures to be maintained below critical values.

4,389,980

BOILER FOR USE WITH CHARGES OF WOOD FUEL

Richard P. Marcotte, and John W. Dumont, Jr., both of Monmouth, Me., assignors to Dumont Industries, Monmouth, Me.

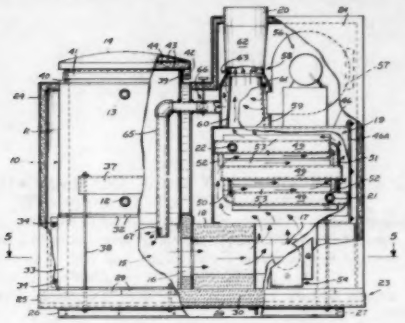
Continuation-in-part of Ser. No. 114,227, Jan. 22, 1980, abandoned. This application Oct. 21, 1980, Ser. No. 199,333

Int. Cl.³ F22B 9/02

U.S. Cl. 122—114 **17 Claims**

15. A boiler for use with a charge of wood as fuel and including a base provided with a fire brick layer, a first chamber that is normally closed and substantially air tight and has a lower portion resting on said fire brick and establishing therewith a

combustion zone, an upper portion that is a water jacket, an intermediate flat ring resting on the upper end of the lower chamber portion, said upper portion including a depending flange that is a fit inside the upper end of the lower portion, and means connecting said upper portion to said base and clamping said portions against said ring and said lower portion against said base to provide leakproof joints, said chamber dimensioned to accommodate a charge of wood consisting of pieces of wood of a length such that with the ends resting on the fire brick, the pieces extending more or less vertically into the upper chamber portion or a stack of shorter sections that may



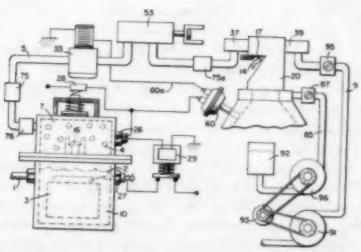
lay crosswise of the chamber, in either case the major portion of the charge in the upper portion and the charge free to settle as combustion progresses, a second chamber in communication with the combustion zone, a heat exchanger supported by the second chamber to receive hot gases therefrom and provided with a flue for exciting gases, means to induce the flow of hot gases through the heat exchanger, and means to deliver air into the lower portion of the first chamber as a turbulent cross draft, said cross draft and the cooling effect of said water jacket functioning to confine the burning of the charge to said combustion zone.

4,389,981

HYDROGEN GAS INJECTOR SYSTEM FOR INTERNAL COMBUSTION ENGINE

Stanley A. Meyer, 3792 Broadway Blvd., Grove City, Ohio 43123

Filed Feb. 17, 1982, Ser. No. 349,185
Int. Cl.³ F02M *23/04*
U.S. Cl. 123—3 **19 Claims**



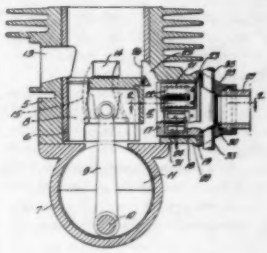
1. A combustion system comprising:
a hydrogen/oxygen generator,
a housing having a water reservoir for retaining natural water therein and a gas collection chamber maintaining a preset volume of gas under pressure,
a pair of similar non-oxidizing plates positioned in said water reservoir,
a direct current voltage source connected to said plates to disassociate the hydrogen atoms and oxygen atoms from said water molecules; and
a gas mixing chamber,
means connecting the hydrogen gas from said hydrogen source to said mixing chamber,
a fuel linear control valve in said hydrogen gas connecting means for regulating the hydrogen gas flow to said mixing means,
said fuel linear control valve including a port and a linear element in said port regulating the opening therein,
a source of non-volatile gas;
means connecting the non-volatile gas from said non-volatile source to said mixing chamber,
ambient air intake means connected to the input of said mixing chamber for combining air with said hydrogen gas and said non-volatile gasses,
a gas burner having said controlled amount of hydrogen gas combined with said non-volatile gas and ambient air from said air-intake means fed thereto.

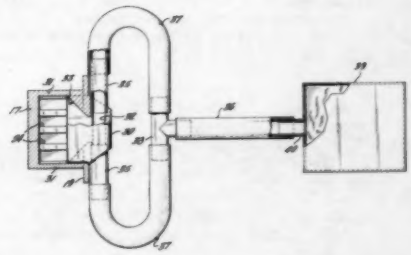
4,389,982

INTERNAL COMBUSTION ENGINE FUEL SUPPLY SYSTEM

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Filed Oct. 20, 1981, Ser. No. 313,212
Int. Cl.³ F02M *35/10*; F02B *33/04*
U.S. Cl. 123—73 R **7 Claims**





1. An internal combustion engine having a piston working in a cylinder and with a fuel intake channel for delivery of fuel to the cylinder under the influence of pressure changes effected by motion of the piston, valve means in the intake channel for controlling the flow of fuel through the intake channel, walls defining the intake channel upstream of the valve means with portions of such walls at different distances from each other in different regions upstream and downstream of the intake channel thereby providing different cross-sectional areas within said walls in said different regions, an element positioned in the intake channel upstream of the valve means and spaced from said walls and proportioned to reduce the difference in cross-

sectional flow areas in said different regions, a passage within said element and having an orifice presented downstream of the intake channel, and a vessel positioned externally of the intake channel and having a connection communicating with the passage within said element.

4,389,983

PRECHAMBER CATALYTIC IGNITION SYSTEM

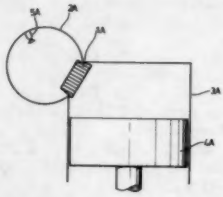
Bernard E. Enga, Maidenhead, and Christopher Prasad, Sonning Common, Near Reading, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 109,907, Jan. 7, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,590

Claims priority, application United Kingdom, Jan. 10, 1979, 7900874

Int. Cl.³ F02B 75/12, 23/00; F02P 1/00

U.S. Cl. 123—143 B 15 Claims



1. A catalytic engine for producing power by the combustion of fuel comprising at least one cylinder, each cylinder having an associated piston and a port disposed near the top of the cylinder and in communication with a precombustion chamber which is located outside the cylinder, a fuel injector located in the precombustion chamber for injecting fuel into the precombustion chamber at a point spaced from said port, and a catalytic unit disposed in and across the port for catalytically igniting the resulting injected fuel/air mixture to thereby operate said piston, the catalytic unit including a thermally stable and oxidation resistant member having a multiplicity of flow paths, the surfaces of which possess catalytic activity.

4,389,984

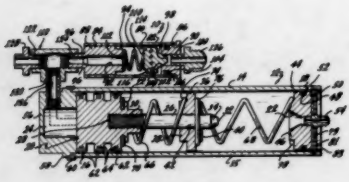
POST-SHUTDOWN COOLANT-SUPPLY DEVICE

Terry G. Destrampe, P. O. Box 372, Maricopa, Calif. 93252

Filed Mar. 26, 1981, Ser. No. 247,900

Int. Cl.³ F15B 1/04; F16N 7/14; F01M 1/04; F01B 31/00

U.S. Cl. 123—196 S 6 Claims



1. In combination with a post-shutdown cooling system for an apparatus receiving coolant under pressure from an engine including a coolant reservoir and a pump drawing coolant from the reservoir and supplying it to said apparatus during normal engine operation, said post-shutdown cooling system including a coolant accumulator comprising a cylinder having an upstream end and a downstream end, a piston reciprocably mounted in said cylinder, means mounted in said cylinder for biasing said piston toward said upstream end, a first conduit for supplying coolant from said pump to said upstream end of said cylinder for moving said piston toward said downstream end of said cylinder to load said biasing means and a second conduit for supplying fluid from said accumulator to said apparatus, the improvement which comprises:

means connecting said downstream end of said cylinder to said coolant reservoir for returning any coolant passing downstream of said piston to said reservoir; and

valve means provided in said accumulator in fluid communication with said connecting means for controlling flow of coolant from said downstream end of said cylinder to said reservoir.

4,389,985

APPARATUS FOR ESTABLISHING AND TERMINATING CONNECTIONS BETWEEN CRANKSHAFTS

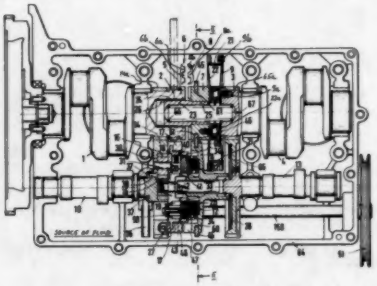
Lothar Huber, Bühl-Altschweier, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Feb. 12, 1981, Ser. No. 233,952

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 2005369

Int. Cl.³ F02B 75/18

U.S. Cl. 123—198 F 42 Claims



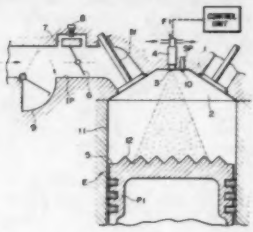
1. Apparatus for connecting and disconnecting first and second sections of an internal combustion engine, comprising coaxial first and second rotary crankshafts having end portions which are adjacent to each other, said first and second crankshafts respectively forming part of said first and second sections; accelerating means operable to raise the speed of said second crankshaft to at least approximate the speed of said first crankshaft; and clutch means operative to positively couple said crankshafts to each other upon completed acceleration of said second crankshaft, said clutch means comprising a first clutch member driven by the end portion of said first crankshaft and having a first profile facing said second crankshaft, a second clutch member driven by the end portion of said second crankshaft and having a second profile complementary to said first profile, means for axially movably securing at least one of said clutch members to the respective crankshaft so that the profile of said one clutch member can move into and from positive engagement with the profile of the other of said clutch members in response to axial movement of said one clutch member relative to said crankshafts, and control means for moving said one clutch member toward said other clutch member to thereby positively engage said profiles in response to completed acceleration of said second crankshaft.

4,389,986

DIRECT INJECTION TYPE INTERNAL COMBUSTION ENGINE WITH A LOW PRESSURE FUEL INJECTOR

Yasusi Tanasawa, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Noyoya, Japan

Filed Jun. 17, 1980, Ser. No. 160,283
Claims priority, application Japan, Jun. 30, 1979, 54-83293
Int. Cl.³ F02B 3/02
U.S. Cl. 123—298 15 Claims



1. A direct injection type internal combustion engine having a crankshaft, an intake pipe, an exhaust pipe, and a low pressure fuel injector comprising:
a cylinder block having at least one cylinder, said cylinder having a central axis;
a cylinder head mounted on said cylinder block;
a piston having a large top surface area and a high heat transfer ability and reciprocally movable within said cylinder for effecting rotational motions to said crankshaft;
a combustion chamber having an upper wall, said combustion chamber being formed by said piston, said cylinder and said cylinder head;
an intake valve mechanism for opening and closing said intake pipe to be communicated with said combustion chamber;
igniting means having an igniting portion facing said combustion chamber;
said low pressure fuel injector having an injection port for injecting a low pressure fuel in a cone shape pattern across a wide injection angle through said at least one cylinder and being disposed at a central portion of said upper wall in said combustion chamber;
said injection port being directed toward said top surface area of said piston and parallel with said central cylinder axis in order to completely vaporize said low pressure fuel on said top surface area of said piston during a suction stroke of said engine;
exhaust valve means for opening and closing said exhaust pipe to be communicated with said combustion chamber; and
means for instantly vaporizing substantially all of said low pressure fuel upon contact with said large top surface area of said piston during said suction stroke.

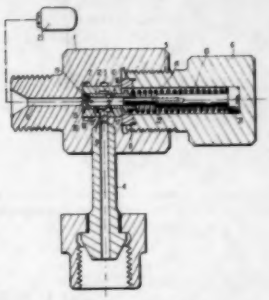
4,389,987

CONTROL MEMBER FOR FUEL INJECTION DEVICES

Gerhard Fränkle, Remshalden, and Friedrich-Wilhelm Hase, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,410
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911447
Int. Cl.³ F02M 45/06
U.S. Cl. 123—300 15 Claims

1. A control member for regulating a flow of fuel to fuel injection means for an air-compressing internal combustion engine, the control member is adapted to be arranged in one of a zone of an injection valve or within the injection valve, the control member includes a flow controlling axially movable control means having an axial bore, spring means for urging the control means into an end position preventing a full flow of fuel through the control member, a spring chamber means for accommodating the spring means, a throttle means arranged in an end face of the control means facing an intake line means of the control member, the throttle means is arranged so as to communicate the inlet line means with the spring chamber means through the axial bore when the control means is in the end position, and means provided in the control member for enabling fuel from the intake line means to flow through the axial bore to an outlet duct leading to an injection valve upon a predetermined axial displacement of the control means in a working stroke direction against a force of the spring means during each injection cycle, characterized in that means are provided for minimizing an open volume of the spring chamber means, at least one first bore means is provided in the



control means for selectively communicating the axial bore with the outlet duct, a control edge means is provided for controlling an opening and closing of the first bore means, the control edge means is arranged so as to close the first bore means after the control means is axially displaced over a predetermined portion of the working stroke, at least one further throttle bore means in communication with the axial bore is provided in the control means at a position offset in a longitudinal direction of the control means with respect to the first bore means, and in that at least one second bore means is provided in the control means at a position offset in a longitudinal direction of the control means with respect to the further throttle bore means in a direction toward the end face of the control means.

4,389,988

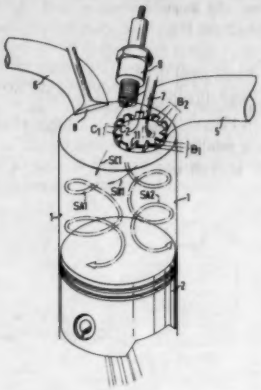
INTAKE PORT FOR AN INTERNAL COMBUSTION ENGINE

Sink H. Ong, 2210 Wilshire Blvd., #577, Santa Monica, Calif. 90403

Filed Apr. 6, 1981, Ser. No. 251,289
Int. Cl.³ F02B 31/00
U.S. Cl. 123—306 5 Claims

1. An intake port for an internal combustion engine having a cylinder, a piston reciprocally operating therein to form a combustion chamber, an exhaust port for the combustion chamber, an exhaust valve and seat operably mounted in the exhaust port, an inlet port delivering a fuel air mixture to the combustion chamber, an inlet valve and seat operatively mounted in the inlet port, and a spark plug for igniting the fuel-air mixture in the combustion chamber, comprising a plurality of fins disposed in the intake port for controlling the flow of fuel-air mixture into the combustion chamber, said fins being formed into a plurality of groups each of which directs the flow of fuel-air mixture in substantially opposite directions

with respect to the other as it enters the combustion chamber to thereby produce counter-rotating swirls of fuel-air mixture



within the combustion chamber at least during the intake cycle of the engine.

4,389,989

ELECTRONIC ARRANGEMENT FOR IDLING STABILIZATION

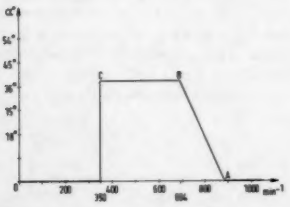
F. Gunter Hartig, Karlsruhe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,668

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026192

Int. Cl.³ F02D *5/04*

U.S. Cl. 123—339 **4 Claims**



1. In an electronic arrangement for idling stabilization between a signal transmitter for ignition spark formation and an ignition device for internal combustion engines, in which for a falling engine rotational speed the ignition timepoint is advanced below a first engine rotational speed (A) at the high end of a stabilization range until a second intermediate engine rotational speed (B) in the stabilization range is reached, said advance in ignition being attained by a delay circuit supplying a constant delay signal between said first and second engine rotational speeds, and then the ignition timepoint is maintained constant until a third engine rotational speed (C) at the low end of the stabilization range is reached, said constant ignition timepoint being attained by said delay circuit supplying an increased delay signal between said second and third engine rotational speeds, and wherein undelayed pulses are generated outside of the stabilization range, said delay circuit including a sawtooth generator triggered by an edge of a pulse from said signal transmitter, said sawtooth generator being coupled at the output side thereof to a storage means and an amplifier, coupled parallel to said storage means, having an element non-linear with respect to voltage in the feedback branch of the amplifier, a comparator means coupled to the outputs of said amplifier and said storage means, for detecting when the signal from said amplifier exceeds the value stored in said storage means and generating a signal which is coupled to said ignition device.

4,389,990

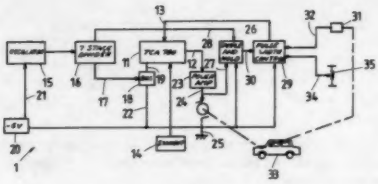
SERVO APPARATUS FOR AN AUTOMATIC SPEED CONTROL OF VEHICLES

Alan B. Murray, Forest Hills, South Africa, assignor to Control Logic (Proprietary) Limited, Durban, South Africa

Filed Sep. 24, 1981, Ser. No. 305,353

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—353 **14 Claims**



1. Servo apparatus for automatic control of an engine throttle in accordance with an error signal, comprising:

an electric motor, adapted to have a direct linkage on its shaft which is connectable to a vehicle engine throttle to open the throttle against a biasing force by shaft rotation in one direction, and to release the throttle by rotation in the other direction;

a sampling circuit for sampling stable motor back emf values;

a pulsed waveform signal generator having its output connected to drive the motor, and an input for a control signal in accordance with which the pulsed waveform signal is variable to vary the motor torque in the direction of rotation of throttle opening;

a control unit having its output connected to the generator control signal input, and having an error signal input, and a further input connected to receive values from the sampling circuit, the unit being adapted to vary the pulsed waveform signal to rotate the shaft in accordance with the error signal and open the throttle in a controlled manner, to use the sampling circuit input in addition to the error signal to vary the pulsed waveform signal to allow the shaft to rotate and release the throttle under the biasing force, and, to maintain the motor in a stalled condition.

4,389,991

ROTATION SENSITIVE PRESSURE REGULATOR

Dennis H. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01168, § 371 Date Sep. 11, 1980, § 102(e) Date Sep. 11, 1980, PCT Pub. No. WO82/01036, PCT Pub. Date Apr. 1, 1982

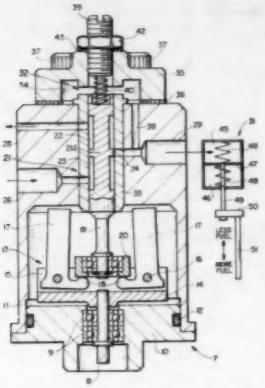
PCT Filed Sep. 11, 1980, Ser. No. 261,097

Int. Cl.³ F02D *7/00*

U.S. Cl. 123—383 **7 Claims**

1. A rotation sensitive pressure regulator (7) having an inlet (26), an outlet (29), valve means (21) for regulating fluid pressure from the inlet (29), the valve means (21) including a reciprocal spool valve (21*a*), fly-weight means (13) for moving the spool valve (21*a*) in a first direction in response to rotation thereof to communicate the inlet (26) with the outlet (29), means (32) for urging the spool valve (21*a*) in a second direction opposite to the first direction in response to fluid pressure in the outlet (29), including pressure chamber means (34) for exposing fluid pressure to an end of the spool valve (21*a*),

passage means (38) for communicating fluid pressure from the outlet (29) to the pressure chamber means (34), and compression spring means (40) for biasing the spool valve (21*a*) in the second direction, means (39) for selectively adjusting the compression of the spring means (40) for establishing a balanced condition in the regulator (7) wherein the force applied to the spool valve (21*a*) by the fly-weight means (13) at least approxi-



mately equals and opposes the combined forces of the spring means (40) and the predetermined pressure in the pressure chamber means (34), means (24) for modulating the fluid pressure in the outlet (29) in response to the position of the spool valve (21*a*), and vent means (28) for venting fluid pressure in the outlet (29) in response to preselected movement of the spool valve (21*a*), in the second direction.

4,389,992

IGNITION TIMING CONTROL METHOD AND SYSTEM THEREFOR

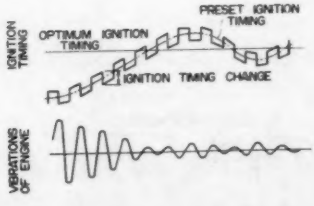
Takashi Shigematsu, and Tomoyuki Watanabe, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 18, 1981, Ser. No. 235,724

Claims priority, application Japan, Feb. 19, 1980, 55-19590

Int. Cl.[3] **B60K** *27/06;* **F02P** *5/14;* **G01L** *23/22;* **F02P** *5/04*

U.S. Cl. 123—419 **7 Claims**



1. An ignition timing control method in an internal combustion engine, comprising:

alternately advancing and delaying an ignition timing from a reference ignition timing at a predetermined frequency, to thereby vibrate the engine;

detecting an amplitude of the engine vibrations substantially at said predetermined frequency; and

adjusting said reference ignition timing so that said amplitude can be decreased in response to the detected result.

4,389,993

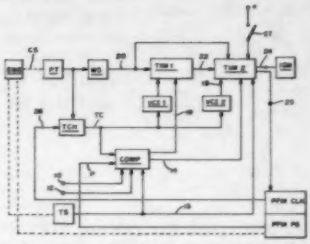
ELECTRONIC IGNITION SYSTEM

Emile D. Long, and Keith C. Richardson, both of Elmira, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 889,996, Mar. 24, 1978, abandoned. This application Jun. 11, 1980, Ser. No. 158,439

Int. Cl.[3] **F02P** *5/04;* **F02B** *3/00;* **G06F** *7/38*

U.S. Cl. 123—421 **33 Claims**



1. A system for controlling the timing of an internal combustion engine having a rotatable power shaft and an ignition pulse generating means producing a recurring ignition pulse, comprising:

timing means for producing a timing signal recurring at a timing rate proportional to the rotational speed of said power shaft, and at a predetermined rotational angle of said power shaft,

temperature sensing means producing a signal indicative of the temperature of said engine over a temperature range, said temperature range having an upper limit and a lower limit and said temperature sensing means producing a heat signal proportional to the temperature within said range;

an advance means connected to said heat signal and said timing signal, said advance means including means for combining said timing signal and said heat signal to produce an ignition pulse, the rotational angle difference between said timing signal and has ignition pulse being proportional to the difference between said heat signal and one of said temperature range limits and wherein said advance means varies the rotational angle difference between said ignition pulse and said timing signal proportionally to the change in temperature of the engine relative to one of said temperature range limits;

load sensing means producing a load signal having a magnitude varying in response to the load upon said engine, said advance means including control means responsive to said load and heat signals for controlling the occurrence of said ignition pulse in response to load upon said engine and in response to temperature of said engine and

speed sensing means producing a speed signal having a magnitude response to the rotational speed of said power shaft, said control means being operative to advance the occurrence of said ignition pulse in response to increased rotational speed of said power shaft,

wherein said control means comprises a load clamp means having an output circuit and operable to translate said load signal to said output circuit and limit said load signal between a first and second voltage level, a voltage reference source, and a combining means for combining the output of said load clamp with said speed signal and said voltage reference to produce said control signal, said voltage reference having a magnitude such that upon starting of said engine, said control signal has a magnitude of at least that corresponding to production of said ignition pulse in synchronism with said timing signal, said clamp means comprising:

a first means for producing an output in response to said load signal, said first means biased to produce a limit output of

a first magnitude upon said load signal signifying a load on said power shaft exceeding a first amount; and

a second means driven by a first amplifier and biased for producing a limit output of a second magnitude in response to said first means producing an output signifying a load on said power shaft of less than a second amount, so that said second means produces a continuously varying signal in response to changes in the load upon said power shaft which are within a range of said first to said second amount and is limited outside.

4,389,994

INTERNAL COMBUSTION ENGINE CONTROL SYSTEM FOR USE WITH TURBO-CHARGED ENGINE, AND METHOD

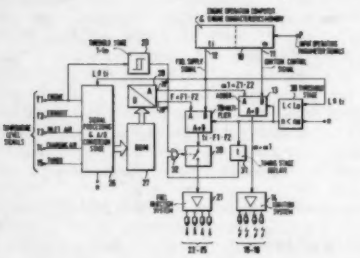
Helmut Denz, Stuttgart; Hans-Peter Stumm, Hemmingen, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 270,964

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022427

Int. Cl.[3] **G05B** *15/02;* **F02D** *5/00;* **F02B** *3/10;* **F02D** *21/04*

U.S. Cl. 123—478 **15 Claims**



1. Internal combustion engine (IC) control system, for an IC engine having a turbocharger

to control the admission and combustion of a fuel-air mixture being supplied to the engine comprising

means for supplying a fuel-air mixture to the engine having a controlled fuel-air ratio;

means (T1) for providing an engine operating temperature signal representative of at least one of: engine temperature (T1); exhaust gas temperature (T2); inlet or induction air temperature (T3); turbo charging air temperatures (T4); turbo charger temperature (T5) arising in the operation of the engine;

means to prevent knocking of the engine which comprises

control means (26, 27, 30) including memory means (27) storing engine operating characteristics as a function of engine operating temperature,

said control means having said engine operating temperature signal applied thereto and furnishing an output signal to said fuel-air mixture supply means upon change of the operating temperature signal, indicative of increased operating temperature, above a predetermined level,

to increase the proportion of fuel to air to thereby enrich the fuel-air mixture being supplied to the engine.

4,389,995

ELECTRONICALLY CONTROLLED FUEL INJECTION METHOD AND APPARATUS

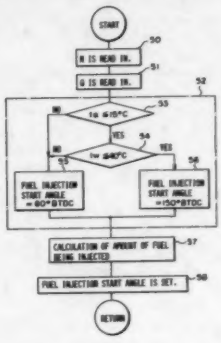
Toshikazu Koide, Susono, and Takehisa Yaegashi, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 15, 1980, Ser. No. 216,433

Claims priority, application Japan, Oct. 13, 1980, 55-141969

Int. Cl.[3] **F02D** *5/02*

U.S. Cl. 123—491 **19 Claims**



1. A method of electronically controlling fuel injection in an engine comprising the steps of:

controlling the amount of fuel supplied to said engine by generating an electric signal for operating a fuel injection valve in an intake system of said engine; and

advancing the time at which fuel injection begins with respect to the time that an intake valve of said engine opens when said engine is at a low temperature as compared to when said engine is at a high temperature, said advancing occurring only when a temperature of intake air is below a predetermined value.

4,389,996

METHOD AND APPARATUS FOR ELECTRONICALLY CONTROLLING FUEL INJECTION

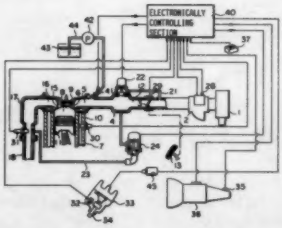
Takehisa Yaegashi, Mishima, and Yukio Kinugasa, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 5, 1981, Ser. No. 260,844

Claims priority, application Japan, Dec. 9, 1980, 55-172630

Int. Cl.[3] **F02D** *9/02;* **G05B** *15/02;* **F02D** *1/04;* **F02M** *25/06*

U.S. Cl. 123—491 **16 Claims**



1. A method of electronically controlling fuel injection in an engine, said engine including an intake passage; a throttle valve disposed in said passage; a fuel injection valve controlled by electric pulses for injecting fuel into said intake passage; a bypass line running in parallel to a portion of said intake passage in which said throttle valve is disposed; a control valve

for controlling the effective cross sectional area of said bypass line; and an electronic controlling section for calculating from operational parameters of said engine an amount of fuel to be injected as well as a flow rate of intake air through said bypass line, thereby controlling said fuel injection valve and said control valve, said method comprising the steps of:

storing a value related to one of a mean value of an intake air flow rate while said engine is operating under first conditions in which the temperature of said engine is higher than a predetermined value, said engine is idling and the opening of said control valve is being calculated by using the rotational speed of said engine as a parameter, and a mean value of the amount of fuel that has been injected while said engine is operating under said first conditions; and

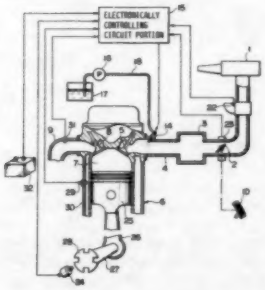
calculating, by using said stored value as a parameter, an amount of fuel to be injected during at least one of the following second conditions: said engine is restarted, the temperature of said engine is lower than a predetermined value, and said engine is lower than a predetermined value, and said engine is accelerating while the temperature of said engine is lower than a predetermined value.

4,389,997

ELECTRONICALLY CONTROLLED METHOD AND APPARATUS FOR VARYING THE AMOUNT OF FUEL INJECTED INTO AN INTERNAL COMBUSTION ENGINE WITH ACCELERATION PEDAL MOVEMENT AND ENGINE TEMPERATURE

Jiro Nakano, and Hideo Miyagi, both of Okazaki, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 22, 1980, Ser. No. 171,031
Claims priority, application Japan, Apr. 28, 1980, 55-55415
Int. Cl.³ F02B 3/00
U.S. Cl. 123—492 **30 Claims**



1. An electronically controlled fuel injection method for an internal combustion engine, wherein a fuel injection valve for injecting fuel into an intake system is controlled by electric signals comprising the steps of:

generating an acceleration signal comprised of pulses in association with both a speed of movement of an acceleration pedal and an engine temperature; and

transmitting to the fuel injection valve, asynchronously with the running of the engine, an increasing number of pulses for increasing a rate of fuel being injected from said fuel injection valve in response to at least one of the speed of movement of the acceleration pedal being increased and the engine temperature being lowered.

16. An apparatus for electronically controlling a fuel injection valve for injecting fuel into an intake system of an internal combustion engine, comprising:

means for producing throttle signals representative of the speed of movement of an acceleration pedal;

means for producing a temperature signal representative of the engine temperature;

means for generating an acceleration signal comprised of pulses related to both said throttle and temperature signals; and

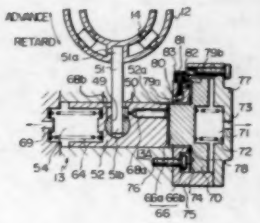
means for transmitting to the fuel injection valve, asynchronously with the running of the engine, an increasing number of pulses for increasing the rate of fuel being injected from said fuel injection valve in response to at least one of the speed of movement of the acceleration pedal being increased and the engine temperature being lowered.

4,389,998

DISTRIBUTION TYPE FUEL INJECTION PUMP

Hachiro Aoki; Hitoshi Tomita, both of Higashimatsuyama, and Kiyoshi Nagamata, Kohnan, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1980, Ser. No. 199,528
Claims priority, application Japan, Oct. 24, 1979, 54-146251[U]
Int. Cl.³ F02M 59/20
U.S. Cl. 123—502 **4 Claims**



1. A fuel injection pump for use in a fuel injection combustion engine, comprising:

a housing having a fuel chamber therein;

a plunger movably mounted in said housing and forming a plunger chamber between a head of said plunger and said housing;

first cam means fixedly mounted on said plunger;

second cam means turnably mounted on said housing and cooperating with said first cam means so as to cause reciprocal motion of said plunger along the axis thereof during plunger rotation with respect to said second cam means, said second cam means being capable of taking one of a plurality of angular positions thereof;

fuel supply for introducing fuel into said plunger during a suction stroke of said plunger;

a delivery port for feeding fuel to the engine from said plunger chamber during a delivery stroke of said plunger;

a leak port formed in said plunger and connected to said plunger chamber;

a control sleeve slidably mounted on said plunger for normally closing said leak port and for connecting said leak port to said fuel chamber at the end of the delivery stroke to terminate the fuel injection;

a governor device actuating said control sleeve for controlling the quantity of fuel to be injected;

injection timing control means for controlling the angular position of said second cam means in response to the engine speed;

injection timing adjusting means for providing an adjusted movement of said second cam means toward a determined angular position so as to advance the injection timing under a preselected operating condition of said engine at the engine start;

auxiliary injection timing adjusting means for releasing the adjusting movement of said second cam means by said injection timing adjusting means when the engine temper-

ature is elevated over a predetermined level to effect the controlling of the angular position of said second cam means in response to the engine speed by said injection timing control means;

said injection timing adjusting means including:

a first cylinder and a second cylinder both mounted on said housing;

a first piston slidably mounted in said first cylinder and connected to said second cam means, said first piston forming a pressure chamber over a pressure receiving area A_1 thereof and being effected by fuel pressure, in response to the engine speed, introduced into said pressure chamber to move said second cam means toward injection timing advancing;

a first spring urging said first piston toward injection timing retarding, said first piston moving in accordance with the difference between an elasticity of said first spring and said pressure in said pressure chamber,

a second piston slidably mounted in said second cylinder coaxially with an axial line of said first piston and having a pressure receiving area A_2 facing said pressure chamber, said area A_2 being larger than said pressure receiving area A_1 of said first piston;

a second spring urging said second piston toward said pressure chamber for causing an end surface to fall in abutting contact with a portion of the end surface of said first piston, by the abutment between said first piston and said second piston, said first piston being adjusted in axial position thereof to a predetermined position where the injection timing is advanced, said second piston moving in accordance with the difference between the elasticity of said second spring and the fuel pressure in said pressure chamber, said second spring having a higher elasticity F_2 than elasticity F_1 of said first spring, said areas A_1 and A_2 as well as elasticity F_1 and F_2 satisfying the following inequality,

$$F_1/A_1 > F_2/A_2;$$

and a seal ring being attached to the end surface of said second cylinder facing to said pressure chamber for partitioning said pressure chamber into a central pressure chamber formed between end surfaces of said pistons and an auxiliary pressure chamber between end surfaces of said second piston and said second cylinder when said seal ring is engaged with the end surface of said second piston facing to said pressure chamber, said pressure chamber communicated with said fuel chamber in said housing;

said auxiliary injection timing adjusting means comprising:

a communicating passage formed in said second cylinder for communicating said control pressure chamber with said auxiliary peripheral chamber, and

a valve means which opens said communicating passage only when the engine temperature is elevated above a predetermined level.

4,389,999

ULTRASONIC CHECK VALVE AND DIESEL FUEL INJECTOR

Vance W. Jaqua, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 179,325, Aug. 18, 1982, abandoned. This application May 17, 1982, Ser. No. 378,544

Int. Cl.³ F02M *47/00*; **F02B** *7/00*

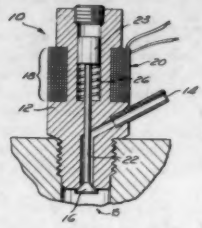
U.S. Cl. 123—536 **5 Claims**

1. An ultrasonic fuel injector suitable for use in a diesel, comprising:

an injector body,

conduit means for allowing a flow of fuel to pass through said injector body, and

a check valve comprising a valve seat at a point along said conduit means, a check valve head engageable with said valve seat to close-off said conduit means, said check valve head being moveable to a disengaged position with respect to said valve seat, biasing means for urging said check valve head to return to engagement with said valve seat after passage of said flow of fuel, means for connecting said check



valve body to said biasing means and means for applying ultrasonic vibration to said check valve head through said connecting means while said check valve head is in said disengaged position, so that said flow of fuel is atomized.

4,390,000

AIR-FUEL MIXTURE HEATING DEVICE FOR INTERNAL COMBUSTION ENGINE

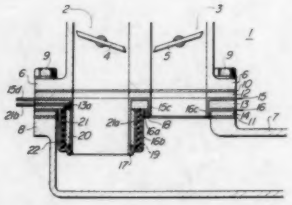
Toshihiko Igashira, Toyokawa; Ken Nomura, Okazaki; Seiko Abe, Kariya, and Yasuhiko Ishida, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 27, 1981, Ser. No. 248,285

Claims priority, application Japan, Mar. 28, 1980, 55-42084[U]; Dec. 5, 1980, 55-172233

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **7 Claims**



1. An air-fuel mixture heating device for an internal combustion engine, adapted to be disposed between fuel supply means and a suction pipe for the engine, for promoting vaporization of a fuel, comprising:

a first metal member including a planar portion, and a pipe portion of minor diameter extending from said planar portion to define a passage for a fuel-air mixture;

a second metal member including a planar portion, and a pipe portion of major diameter extending from said planar portion and arranged outside said pipe portion of minor diameter of said first metal member concentrically therewith, said pipe portions of said first metal member and said second metal member being joined to each other at the end to define a cylindrical space therebetween and said planar portions being adapted to be held between the fuel supply means and the suction pipe;

three flat plates of insulating material holding said members, one between said planar portions and two for clamping the same;

a ceramic heater of positive temperature coefficient characteristic having a specific Curie point mounted in said cylindrical space; and

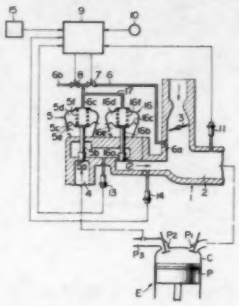
an insulator between said heater and one of said pipe portions.

4,390,001

EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Misao Fujimoto, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 19, 1981, Ser. No. 312,747
Claims priority, application Japan, Oct. 20, 1980, 55-147272
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **6 Claims**



1. An internal combustion engine comprising combustion chamber means, intake passage means leading to said combustion chamber means for providing a supply of intake gas, exhaust passage means leading from said combustion chamber means for exhausting combustion gas therefrom, an exhaust gas recirculation system including exhaust gas recirculation passage means leading from said exhaust passage means to said intake passage means, recirculating gas control valve means provided in said recirculation passage means for controlling recirculated gas flow through said recirculation passage means, means for detecting engine operating conditions and providing an engine operating condition signal, restriction means provided in said recirculation passage means, pressure drop sensing means for detecting a pressure drop across the restriction means, memory means having memories of optimum values of pressure drop under various engine operating conditions, control means for adjusting said control valve means so that the pressure drop detected by the sensing means conforms to the memorized optimum value under a specific engine operating condition, said restriction means comprising restriction valve means of which opening can be varied, means for controlling said restriction valve means so that the opening is increased as the recirculated gas flow is increased.

4,390,002

HINGE FOR COVER OF KETTLE COOKER

Virgil W. Daily, III, Paris, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Aug. 14, 1981, Ser. No. 292,920
Int. Cl.³ A47J *37/07*; E05D *11/06*
U.S. Cl. 126—25 R **15 Claims**

1. A covered kettle cooker barbecue grill comprising a hinge for attaching a cover to a kettle to permit moving the cover between closed and open positions,

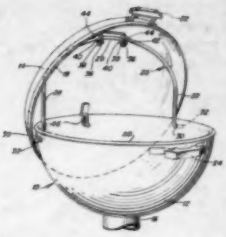
(a) the kettle being a generally hemispherical barbecue grill kettle;

(b) the cover being a generally circular dome-shaped cover for said kettle, said cover having a rim; and

(c) the hinge being for attaching said cover to said kettle, said hinge being disposed within said grill and including:

(i) two spaced legs joined by a bight to form an inverted U-shaped member, each of said legs being shaped to be disposed adjacent to the rim along the underside of said dome-shaped kettle cooker cover, and to conform generally to the shape of said rim, when said cover is in the closed position upon said kettle, said legs being free of any braces connecting said legs to each other, said U-shaped member having fully closed, partially open, and fully opened positions;

(ii) means pivotally securing the lower end of each of said legs to the inner wall of said kettle at opposite sides of the kettle, the locations at which the lower ends of said spaced legs are pivotally secured to said kettle lying in a first pair of adjacent quadrants of said kettle; and



(iii) means pivotally securing the bight, which is at the upper end of said inverted U-shaped member, to the inner wall of said cover at a location that is adjacent the outer perimeter of said dome-shaped cover, and is directly above the other two quadrants of said kettle when said cover and said inverted U-shaped member are in their closed positions, said means pivotally securing the bight extending an opposite sides of the vertical plane that divides said other two quadrants of said kettle,

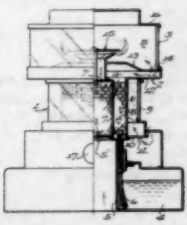
said bight lying outside said kettle when said inverted U-shaped member is in the fully open position.

4,390,003

PETROLEUM COMBUSTION DEVICE

Kazuharu Nakamura, Nagoya; Yoshio Mito, Gifu; Yutaka Nakanishi, Konan, and Toshihiko Yamada, Toyoake, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Nagoya, Japan

Filed May 19, 1981, Ser. No. 265,068
Claims priority, application Japan, Jun. 11, 1980, 55-82168[U]; Jun. 11, 1980, 55-82169[U]
Int. Cl.³ F24C *5/04*
U.S. Cl. 126—96 **5 Claims**



1. A petroleum combustion device comprising a primary combustion chamber composed of a combustion cylinder including an inner flame cylinder, outer flame cylinder and an outer cylinder; a secondary combustion chamber having a base plate and disposed on said primary combustion chamber and provided at that portion of its base plate which is outside said outer cylinder of said primary combustion chamber with means forming an air path, said secondary combustion chamber including an upper flame cylinder located above said air

path; and a flame extension device arranged in said secondary combustion chamber and communicated with the upper portion of said inner flame cylinder of said primary combustion chamber; said outer cylinder of said primary combustion chamber being formed by a transparent or translucent heat resistant heat ray tranmission substance.

4,390,004

UNIVERSAL FURNACE

Karl Kardos, Mölnlycke; Bertil Mattsson, Gothenburg, and Olle Westermark, Falköping, all of Sweden, assignors to Produktutvecklingscentrum i Goteborg, Gothenburg, Sweden

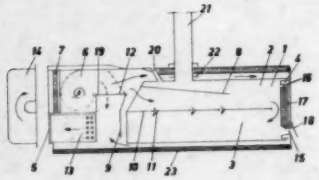
PCT No. PCT/SE80/00131, § 371 Date Jan. 7, 1981, § 102(e) Date Dec. 31, 1980, PCT Pub. No. WO80/02454, PCT Pub. Date Nov. 13, 1980

PCT Filed May 6, 1980, Ser. No. 221,548

Claims priority, application Sweden, May 7, 1979, 7903968

Int. Cl.³ F24H *3/06*

U.S. Cl. 126—104 A **7 Claims**



1. In a furnace for producing hot air with solid or liquid fuels and incorporating a double-shelled combustion chamber having a fuel intake door at one end thereof and a smoke funnel, at least one blower having an inlet and an outlet arranged at the end opposite to said fuel intake door and adapted to force air to be heated through the blower outlet and into the space between said double shells, an outlet for heated air being arranged at the end of the furnace provided with said blower, the improvement comprising substantially horizontally arranged partition members in the space between said double shells to subdivide said space into an upper and a lower zone, said zones being directly adjacent the combustion chamber, and said zones taken together enclosing the combustion chamber, the outlet from said blower being arranged to communicate with said upper zone, and an opening in said partition members situated adjacent the fuel intake end of the furnace, so that the air from the blower outlet passes first through said upper zone to cool the upper part of the combustion chamber wall and thereafter through said lower zone to cool the lower part of the combustion chamber wall.

4,390,005

FAN ACCESSORY FOR HEATER

Donald G. Porter, 8620 Wilkinson Blvd., Charlotte, N.C. 28208

Filed Apr. 5, 1982, Ser. No. 365,594

Int. Cl.³ F24H *3/02*

U.S. Cl. 126—110 B **2 Claims**

2. A fan accessory for recovering heated air generated by a heater and comprising:

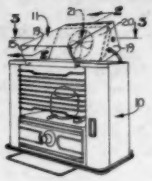
housing means for directing air flow and having an upper wall, a rear wall defining an ambient air inlet, a lower wall defining a heated air inlet, and a front portion defining an air outlet for ambient and heated air,

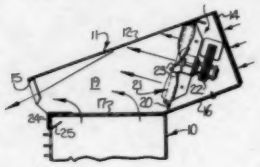
the upper and lower walls of said housing means being convergingly arranged relative to each other toward said air outlet in the direction of air flow to cause the air flow through said outlet to move more rapidly therethrough,

fan means mounted within said housing means for inducing ambient and heated air to enter said inlets and flow through said housing means and out of said air outlet,

said fan means comprising variable speed control means for varying the rate of flow of ambient and heated air through said inlets and out of said outlet,

said fan means being angularly mounted within said housing means so as to cause the air flow through the housing to be





impingingly engaged with the upper wall of the housing, and

heater engaging means on said housing means for positioning the housing to receive through said heated air inlet heated air generated by a heater.

4,390,006

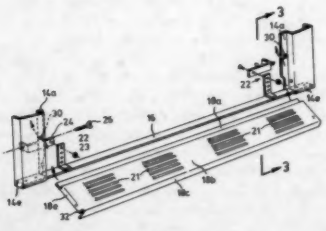
FIREPLACE DOOR ASSEMBLY

Ronald Kowk, Weston, Canada, assignor to Ruth C. Kowk, Weston, Canada

Filed Jan. 23, 1981, Ser. No. 227,592

Int. Cl.³ F24C *15/10*

U.S. Cl. 126—140 **2 Claims**



1. A fireplace door assembly comprising,

(a) a fabricated frame shaped corresponding to the shape of the periphery of a fireplace door opening and defining a door opening,

(b) a door mounted in said frame for opening and closing said door opening, said door having a lower edge,

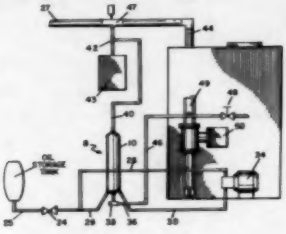
(c) said frame comprising,

(i) a pair of jambs, a header and a fixed sill which are secured to one another to form said frame, said fixed sill extending transversely between the lower ends of the jambs so as to extend in close proximity to the hearth of the fireplace in association with which it is to be used, said fixed sill being sufficiently short in height that it does not form a significant barrier inhibiting the removal of ash or the like from the hearth, and

(ii) a removable sill adapted to be releasably mounted on said frame in a position extending upwardly from said

fixed sill to said lower edge of said door, said removable sill having a substantially greater height than said fixed sill.

4,390,007
FUEL PREHEATER
Gerard A. Paquette, 195 Pool St., Biddeford, Me. 04005
Filed Jun. 30, 1980, Ser. No. 164,887
Int. Cl.³ F24H *1/00*
U.S. Cl. 126—350 R **1 Claim**



1. An oil preheater for use in a heating system of the type where the oil before being preheated is stored in a tank and is preheated at a point in the system while being piped to an oil burner which burns said oil in a furnace having a hot water heating system of the type with hot water exiting from said furnace by means of a hot water feed pipe and re-entering said furnace through a return line pipe, said hot water feed pipe having an air vent and expansion tank thereon, and said return line pipe having a cold water feed for entry of additional water into said hot water heating system at times when additional water is needed to replace any water lost from the system, comprising:

a cannister having a water inlet and a water outlet, an oil inlet and an oil outlet;

a double-coiled tube member located within said cannister having a first and second end, said first end being connected to said oil outlet and said second end being connected to said oil inlet;

a hot water entry pipe extending from said hot water feed pipe between said air vent and expansion tank to said water inlet of said cannister;

a hot water drain pipe extending from said water outlet of said cannister to said return line pipe of said hot water heating system;

first pipe means to provide oil from said oil tank into said cannister's oil inlet;

a second pipe means to deliver oil from said cannister's oil outlet to said oil burner;

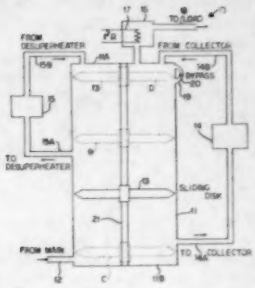
a two-stage pump interconnected to said second pipe means adapted to pump a portion of said oil to said oil burner;

a check valve on said first pipe means providing oil into said cannister to prevent backflow of oil to said oil tank;

a third pipe means extending from said two-stage pump carrying the portion of said oil not pumped into said oil burner back to said first pipe means between said check valve and said oil inlet of said cannister to be recirculated through said cannister to said second pipe means;

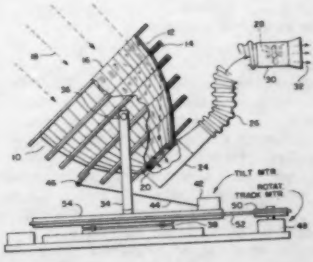
whereby the hot water passes through said hot water heating system and also through said cannister to heat said oil-carrying double-coiled tube member and the oil circulating therein and the oil so heated is carried to said oil burner at a higher temperature than unheated oil with any oil that is not burned in said oil burner being recirculated through said double-coiled tube member to maintain its higher temperature.

4,390,008
HOT WATER TANK FOR USE WITH A COMBINATION OF SOLAR ENERGY AND HEAT-PUMP DESUPERHEATING
John W. Andrews, Sag Harbor, N.Y., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.
Filed Jun. 26, 1980, Ser. No. 163,449
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **10 Claims**



7. A hot water system comprising a hot water storage tank, a baffle displaceably disposed within said tank forming a moving barrier between the volume of cold water entering said tank and the heated water in said tank, a first heat exchanger in the form of a solar collector connected in circuit with said tank, said solar collector having an inlet connected to one end of the tank and an outlet connected to the other end of the tank whereby cold water from below said baffle is circulated from said tank through said collector and back to said tank above said baffle, and a second heat exchanger in the form of a desuperheater connected in circuit with said tank, said desuperheater having an inlet connected intermediate to the ends of said tank and an outlet connected to said one end of the tank whereby, depending upon the position of said baffle relative to said desuperheater inlet, cold water from below said baffle or solar preheated water from above said baffle is circulated from said tank to said desuperheater to be further heated thereby, and an electric resistance heater operatively connected to said tank as a back-up heater for the water in said tank.

4,390,009
SOLAR BOILER
Arthur Consilvio, 65 Poplar Ave., Bronx, N.Y. 10465
Filed May 17, 1982, Ser. No. 379,185
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **6 Claims**



1. A solar boiler comprising:

a solar reflector;

reflector sections constituting the periphery of said solar reflector;

mirror supports defining the longitudinal boundaries of said reflector sections;

mirrors mounted on the inner surfaces of said mirror supports;

a disc located at the central point of said solar reflector;

a plurality of holes in said disc;

a receiving box adjacent to said disc;

a means for causing said reflector to continuously track the sun's rays and focus said rays on said disk, whereby said disk is heated;

a fluid distribution hose attached to said receiving box;

a means for moving a fluid through said fluid distribution hose from said disk to a diffuser attached to the other end of said fluid distribution hose, whereby said fluid will transfer heat from said disk to the ambient into which said diffuser discharges said fluid, wherein said solar reflector is attached to vertical supports at a pivot point and said vertical supports are fixed to a revolving base which is further attached to a mounting base; and

wherein said means for causing said reflector to continuously tract the sun's rays, is a first motor for tilting said reflector with respect to said vertical supports, a rod attached to said first motor, a hinged point which is fixed to end of said rod, a second motor for revolving said solar reflector with respect to said mounting base, a first pulley mounted to said second motor, a second pulley secured to said mounting base, and a pulley belt connecting said first pulley to said second pulley.

4,390,010

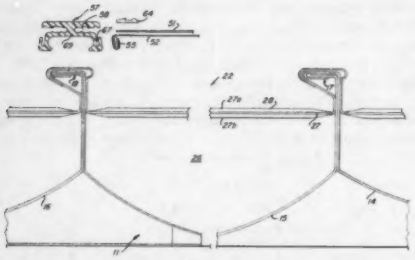
SOLAR ENERGY COLLECTING APPARATUS AND ROLL-FORMED METAL BUILDING

Dale N. Skillman, P.O. Box 1311, Rapid City, S. Dak. 57709

Filed Mar. 12, 1981, Ser. No. 243,264

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **14 Claims**



1. In solar energy collecting apparatus, the combination comprising a solar energy collecting assembly including:

a load supporting structure of a building in the form of a plurality of panels connected side by side at a seam joining means;

a one-piece collector panel having a substantially flat collector plate with an absorber surface provided by an intermediate wall portion of the collector panel for collecting solar energy, said collector plate forming an imperforate weather membrane and forming an airflow passage above said supporting structure using said supporting structure to define a lower portion of said passage, said passage carrying air heated by said collector plate, said collector panel having upper side edge flanges for connecting together adjacent collector plates at continuous seam structure that is seamed to said seam joining means; and

a solar energy transmissive cover mounted on the associated opposed sidewall portions above each collector plate to provide an air space between said cover and associated collector plate, each cover mounting including a side edge connecting member connected along each of the opposite side edges of each cover for fastening said opposite side edges of the cover to the sidewall portions of the associated collector panel at said upper side edge flanges to form an air space above each associated collector plate.

4,390,011

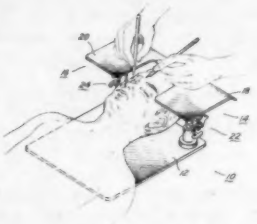
ADJUSTABLE SURGICAL ARM REST AND INSTRUMENT PLATFORM

Daniel R. Evans, 2005 Valparaiso, Valparaiso, Ind. 46383

Filed May 6, 1981, Ser. No. 260,891

Int. Cl.³ A61B *19/00*; A47F *5/10*

U.S. Cl. 128—1 R **11 Claims**



1. An arm and hand rest device for performing surgery on a patient lying on an operating table, comprising a horizontally disposed board for insertion between the patient's body and the operating table, a pedestal connected to said board and having a platform at the top thereof for positioning near the head of the patient lying on the board, said pedestal having an angular adjustment mechanism for varying the angular position of the platform relative to the board, including a support member rigidly secured to said board, a bracket member attached to the platform and connected to said support member, a shaft about which the bracket member is pivotally disposed for releasably securing said support member and bracket member in adjusted positions, and a latching means including a pin extending through one of said members and received by holes in the other of said members for selecting various angular positions for said platform relative to the patient's head, and said support member and bracket member include contacting surfaces rotatable about said shaft and said shaft includes a threaded means for drawing said contacting surfaces into firm engagement with one another to assist in retaining said platform in a rigid position with respect to said pedestal.

4,390,012

RIGID TYPE ENDOSCOPE

Morihide Mizumoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 139,724

Claims priority, application Japan, Apr. 17, 1979, 54-46813

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **14 Claims**

1. In a rigid type endoscope comprising

an ocular having a distal end;

a hollow substantially rigid connecting member connected

to said distal end of said ocular and having an inner peripheral face; and

a rigid cylindrical optic tube having a proximal end portion inserted in said connecting member, said connecting member surrounding said proximal end portion of said rigid cylindrical optic tube;

the improvement comprising:

elastic holding means disposed between said connecting member and said proximal end portion of said rigid cylindrical optic tube, said elastic holding means being elastically fixed to said rigid cylindrical optic tube and being supported by said connecting member, and making a close, elastic, area-to-area contact with both the outer surface of said proximal end portion of said rigid cylindrical optic tube and with said inner peripheral face of said connecting member, for elastically holding said proximal end portion of said rigid cylindrical optic tube, whereby bending stress applied to said rigid cylindrical optic tube is widely distributed along said area-to-area contact surfaces.

4,390,013

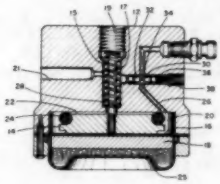
PERCUSSOR ASSEMBLY

Victor L. Bartholomew, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Dec. 29, 1980, Ser. No. 220,274

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—55 **7 Claims**



1. In a percussor assembly having a gas inlet passageway, a first gas chamber communicating therewith, a gas outlet passageway, and movable gas sealing means for providing a gastight seal between said first gas chamber and said gas outlet passageway, whereby increased gas pressure in said first gas chamber moves said gas sealing means and breaks said gastight seal resulting in said increased gas pressure in said gas pressure chamber being relieved through said gas outlet passageway, the improvement comprising

valve means cooperating between said gas inlet passageway and said gas outlet passageway for closing said gas inlet passageway in response to said gas pressure being relieved through said gas outlet passageway.

4,390,014

SELF-RETAINING RIB BELT

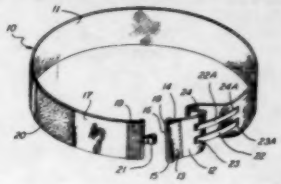
Everett W. Forman, 31 Harper St., Stamford, N.Y. 12167

Filed Oct. 13, 1981, Ser. No. 310,889

Int. Cl.³ A61F *5/02*

U.S. Cl. 128—78 **1 Claim**

1. A self-retaining rib belt comprising the combination of a flexible non-elastic elongate member of bandage material with adjustable closure means and a longitudinally attached outer elastic means, said elastic means unstretched length being shorter than the adjacent longitudinal portion of said elongate member whereby for various sized chests the elongate member obtains finite restriction of chest expansion during inhalation



yet the contracting elastic means prevents slippage of the belt when the chest diminishes in size during exhalation.

4,390,015

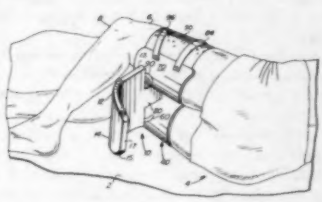
THIGH SUPPORT BRACE

C. Dale Clements, 9662 Gurdon, Boise, Id. 83702

Filed Jan. 8, 1981, Ser. No. 223,254

Int. Cl.³ A61F *3/00, 13/00*

U.S. Cl. 128—80 R **4 Claims**



1. Support brace apparatus for supporting the thighs of a user, comprising, in combination:

base plate means, including

a bottom plate portion having a portion thereof curved toward the user's torso, and

a center plate portion remote from the curved bottom portion extending from said bottom plate portion;

thigh support means pivotally attached to the base plate means, including

a first thigh support,

an arcuately extending first slot in the first thigh support,

means extending through the arcuately extending first slot for securing the first thigh support to the bottom plate portion,

a second thigh support,

an arcuately extending second slot in the second thigh support, and

means extending through the arcuately extending second slot for securing the second thigh support to the center plate portion;

a first hinge secured to the first thigh support and pivotally secured to the center plate;

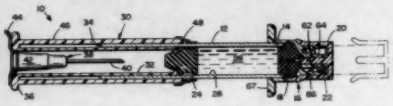
a second high secured to the second thigh support and pivotally secured to the center plate in juxtaposed relation to said first hinge; and

means for securing the thigh support means to the thighs of a user to secure the user to the support brace apparatus.

4,390,016
PREFILLABLE HYPODERMIC SYRINGE AND METHOD OF ASSEMBLING THE SYRINGE

Gordon S. Riess, Beverly Hills, Calif., assignor to Temp-Trak Inc., Beverly Hills, Calif.

Filed Oct. 23, 1981, Ser. No. 314,188
Int. Cl.³ A61M 5/00
U.S. Cl. 604—236 7 Claims



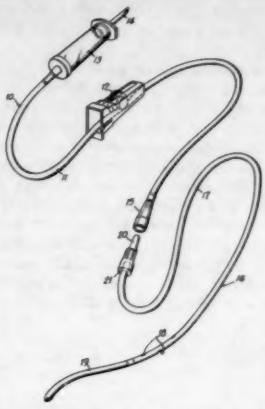
1. A prefillable hypodermic syringe assembly, comprising:
(a) an open ended barrel having opposite front and back ends;
(b) a resilient sealing bung disengagably connected with and closing the front end of said barrel, said bung including an opening therethrough for the passage of liquid medication from within said barrel;
(c) cap means for closing said opening until said assembly is used, at which time said cap means can be removed, said cap means including means for engaging the front end of said bung so as to cause the latter to collapse upon itself sufficient to close said opening whereby to prevent any liquid medication within said chamber from coming in contact with said cap means;
(d) a hollow syringe needle;
(e) means for supporting said needle in fluid communication with the front end of said bung opening during use of the assembly;
(f) a resilient plunger disposed within said barrel and spaced rearwardly of said bung at a predetermined storage position, whereby to define a medication chamber therebetween; and
(g) means disposed partially within and partially outside said barrel and engagable with said plunger for moving the latter from its storage position to a position adjacent said bung, whereby to cause liquid medication within said chamber to be forced through said bung opening and said needle when the latter is supported in fluid communication with said opening.

4,390,017
ENTERAL FEEDING SYSTEM

Eugene O. Harrison, 1372 Fairview Rd., NE., Atlanta, Ga. 30306; David J. Martin, 3531 Tewksbury Dr., Snellville, Ga. 30278, and Martin L. Olson, 340 Blvd., NE, Atlanta, Ga. 30312

Filed Aug. 7, 1981, Ser. No. 290,820
Int. Cl.³ A61J 7/00
U.S. Cl. 604—270 10 Claims

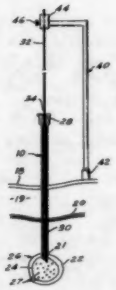
1. An enteral feeding system comprising a feeding tube assembly having a feeding tube body containing perforations near one end thereof and having a tapered connector element on its other end adapted for coupling with a mating connector element of an administration set, and said feeding tube assembly removably receiving therein a semi-rigid guide wire having an attached double-ended tapered adapter which can be coupled with said tapered connector element and with the nozzle of an irrigation syringe.



4,390,018
METHOD FOR PREVENTING LOSS OF SPINAL FLUID AFTER SPINAL TAP

Henry J. Zakowski, 72 N. Deeplands Rd., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 187,354, Sep. 15, 1980, abandoned. This application May 17, 1982, Ser. No. 379,109
Int. Cl.³ A61B 17/00
U.S. Cl. 128—303 R 7 Claims



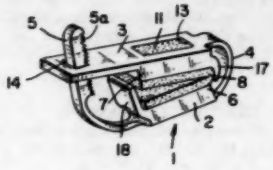
1. A method of sealing a hole in the spinal canal of a patient made by a needle used to make a spinal tap, comprising inserting a member, capable of swelling on contact with body fluid, into the lumen of the needle before removing the needle from the patient after making a spinal tap and while the tip of the needle remains disposed in the hole in the spinal canal formed during penetration thereof by the needle, advancing said member to the tip of the needle, and thereafter withdrawing the tip of the needle without withdrawing said member so that said member will remain in situ in the hole as a plug and will swell by reason of contact with body fluid to effectively seal the hole.

4,390,019

BLOOD VESSEL CLAMP

Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y. 11209, and Eric G. LeVeen, 333 East 49th St., New York, N.Y. 10017

Filed Feb. 28, 1979, Ser. No. 15,969
Int. Cl.³ A61B 17/12
U.S. Cl. 128—325 6 Claims



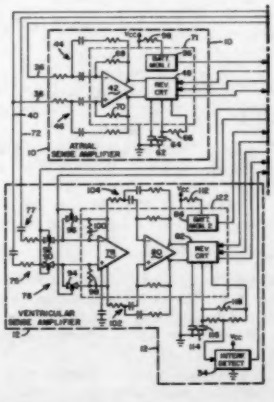
1. A surgical clamp comprising a pair of arms, each arm being interconnected at one end to one end of the other arm by a flexible, resilient member urging said arms apart and each said arm having an end opposite to said one end thereof, said member permitting said arms to be moved toward each other until they are generally parallel, one of said arms having an intermediate, part engaging clamping portion facing the other of said arms and the other of said arms having an intermediate, part engaging, clamping portion facing the clamping portion of said one arm, a layer of resilient material on each of the facing surfaces of said clamping portions, said material being softer than the material of said clamping portions, and releasable ratchet means at the opposite end of one of said arms and extending toward and being engageable with the other of said arms adjacent the opposite end of the last-mentioned other arm, when the arms are moved toward each other, for holding said arms in fixed relative positions.

4,390,020

IMPLANTABLE MEDICAL DEVICE AND POWER SOURCE DEPLETION CONTROL THEREFOR

Lodewijk-Jozef Herpers, Kerkrade-West, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 17, 1983, Ser. No. 235,069
Int. Cl.³ D61N 1/36
U.S. Cl. 128—419 PG 30 Claims



1. A programmable medical device having programmable means responsive to externally applied programming signals for programming the operation of the medical device in one of a plurality of operating modes and operating rates comprising:

a depletable power source for powering said medical device;

power source energy detecting means coupled to said power source for providing a first end-of-life signal at a first depletion level and a second end-of-life signal at a second depletion level lower than said first depletion level;

first rate and mode switching means coupled to said programmable means and said detecting means and responsive to an externally applied testing signal for operating said medical device in a first predetermined mode and at the programmed rate when neither a first nor a second end-of-life signal is present;

second rate and mode switching means coupled to said programmable means and said detecting means and responsive to said testing signal for operating said medical device in the first predetermined mode and at a first predetermined rate when said first end-of-life signal is present; and

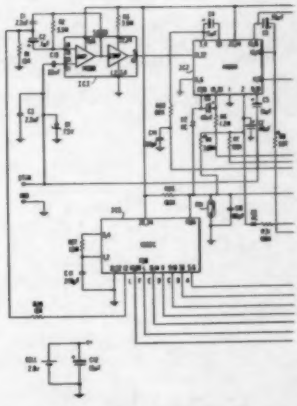
third rate and mode switching means coupled to said programmable means and said detecting means and responsive to said testing signal for operating said medical device in a second predetermined mode and rate when said second end-of-life signal is present.

4,390,021

TWO PULSE TACHYCARDIA CONTROL PACER

Roworth A. J. Spurrell, London, England; Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Mar. 19, 1981, Ser. No. 245,215
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 109 Claims

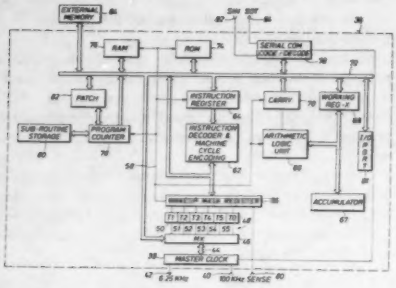


1. A tachycardia control pacer comprising means for confirming tachycardia; means responsive to said confirming means for generating and applying to the heart of a patient a pair of heart-stimulating pulses, the first of said pulses being generated at the end of an initial delay which follows operation of said confirming means, and the second of said pulses being generated at the end of a coupled interval which follows said first pulse; and means for scanning both said initial delay and said coupled interval during successive cycles of operation of said pulse generating means, said pulse generating means generating the second pulse in each pair independent of the effect of the respective first pulse on the patient's heart.

4,390,022
IMPLANTABLE DEVICE WITH MICROPROCESSOR CONTROL

Richard V. Calfee, Houston, Tex., and Jay Miner, Mountain View, Calif., assignors to Intermedics, Inc., Freeport, Tex.

Filed May 18, 1981, Ser. No. 264,600
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **6 Claims**



1. A programmable implantable body function assistance device comprising:

a microprocessor for executing stored instructions in a sequence directed by a program counter,

ROM means for providing a fixed set of instructions to said microprocessor,

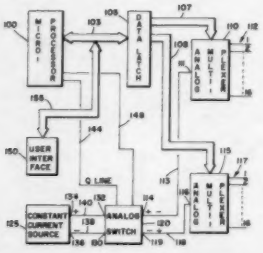
RAM means for providing a programmable set of instructions, and

programmable patch register means interconnecting said microprocessor, said program counter and said RAM means for causing instructions stored in said RAM means to be executed when said program counter corresponds to a programmed count in said patch register.

4,390,023
PATTERNED ELECTRICAL TISSUE STIMULATOR

Mark T. Rise, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1981, Ser. No. 259,099
Int. Cl.³ A61N 1/32
U.S. Cl. 128—421 **5 Claims**



1. A portable automatically controlled electrical tissue stimulator comprising:

means for producing electrical stimulation current, the polarity of said current controllable by a current control signal;

a plurality of electrodes for attachment in an array to a patient to be treated;

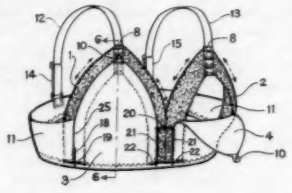
multiplexing means operatively connected between said current means and said electrodes, and responsive to a multiplexing signal for selectively connecting any pair of electrodes to said current means; and

presettable automatic control means including memory means for storing presettable digitally encoded information indicative of a desired sequence of electrode pair connections and a desired number of current pulses to be applied to each of the pairs connected in the sequence and further including means responsive to said information stored in said memory means to produce said multiplexing signal and said current control signal to cause said electrodes to be sequentially connected to said current means automatically and stimulation current pulses of alternating polarity to be delivered to said pairs of said electrodes automatically.

4,390,024
MATERNITY BRASSIERE

Marguerite R. Williams, 443 W. 44th St., New York, N.Y. 10036

Filed Feb. 5, 1982, Ser. No. 346,391
Int. Cl.³ A41C 3/04
U.S. Cl. 128—460 **4 Claims**



1. In a maternity brassiere, inner breast-supporting cups joined together in the bottom center area of the brassiere and also joined in abutting relation to each of the side portions of a partially body-encircling band having lateral adjustable means in the rear,

said inner cups overlaying the inward portion of wide stretchable bands which cover the periphery of the upper portion of each breast,

said inner cups and said wide stretchable bands acting in concert in such manner as to expand or contract in conformance with the expansion or contraction of the breasts of the wearer during pregnancy and after birth, said wide stretchable bands being affixed to the bottom region of the brassiere at the sides and in the center thereof,

a pair of shoulder straps connected in the rear to said partially body-encircling band and in the front to the apices of said wide stretchable bands.

4,390,025
ULTRASONIC DISPLAY APPARATUS HAVING MEANS FOR DETECTING THE POSITION OF AN ULTRASONIC PROBE

Yasuhiko Takemura, Tochigi, and Kazuyoshi Saito, Yaita, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

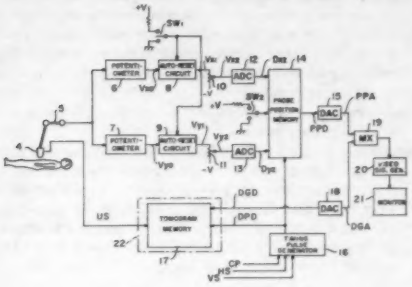
Filed Apr. 17, 1981, Ser. No. 255,178
Claims priority, application Japan, Apr. 24, 1980, 55-53482
Int. Cl.³ A61B 5/00
U.S. Cl. 128—660 **7 Claims**

1. An ultrasonic diagnosis apparatus including an ultrasonic probe, wherein an ultrasonic tomogram and a planar symbolized pattern of a human body are simultaneously displayed on the screen of a monitor, said ultrasonic diagnosis apparatus comprising:

means for detecting a predetermined number of positions of the ultrasonic probe in a two-dimensional plane relative to a reference point in the plane, and for generating signals identifying said position, said position-detecting means including auto-reset circuit means for generating a predetermined standard voltage identifying said reference point regardless of the position of said ultrasonic probe;

first memory means for storing said symbolized pattern, said reference point and said predetermined positions with respect to said symbolized pattern, and said signals generated by said position detecting apparatus;

second memory means for storing ultrasonic tomogram signals received by said ultrasonic probe relative to said predetermined positions;



timing pulse generating apparatus for simultaneously reading out said stored information from said first and second memory means as to the detected positions of said probe; and

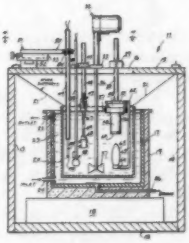
means for simultaneously displaying on said screen the position of said probe relative to said symbolized pattern and the tomogram relative to the probe position reflecting said read-out information.

4,390,026

ULTRASONIC THERAPY APPLICATOR THAT MEASURES DOSAGE

Chris L. Christman, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed May 22, 1981, Ser. No. 266,379
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—660 **17 Claims**



1. An apparatus for measuring the integral dose ϵ applied for a time period t to a body of living tissue undergoing exposure to ultrasonic wave energy comprising a reverberation tank containing liquid, transducer means coupled to said liquid, a hydrophone mounted so as to be immersed in the liquid, circuit means to drive the transducer means to generate ultrasonic wave energy, means to create a diffuse field in the liquid in the tank, means to expose the living tissue to the liquid, means to measure the total power P absorbed within the tank, and circuit means connected to said hydrophone to measure the decay rates D_s and D_f of ultrasonic wave energy pulses respectively with the tissue in the liquid and with the tissue removed from the liquid, whereby the integral dose ϵ can be computed according to the equation:

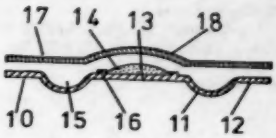
$$\epsilon = P(D_2 - D_f)/D_s .$$

4,390,027

APPLICATION UNIT FOR EPICUTANEOUS TESTING OR TREATMENT

Safwat D. Alani, Wiesdorfer Platz 52, and Milhim D. Seilman, Postfach 10 11 66, both of D-5090 Leverkusen 1, Fed. Rep. of Germany

PCT No. PCT/SE80/00191, § 371 Date Mar. 19, 1981, § 102(e) Date Mar. 19, 1981, PCT Pub. No. WO81/00199, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 18, 1980, Ser. No. 245,644
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—743 **8 Claims**



1. An application unit comprising:

(a) a substantially planar carrier with an adhesive surface and at least one application device and

(b) a covering layer substantially coextensive with the carrier, each application device consisting of a durable sheet made of nonabsorbent, impermeable material and

(c) an application surface for one substance in substantially the same plane as that of the carrier and

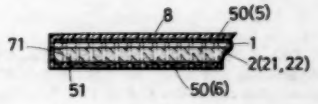
(d) an annular groove surrounding and extending from the application surface in a direction opposite that of the adhesive surface; the covering layer being substantially planar, but having an elevated area corresponding to each application surface and projecting in a direction opposite that of the annular groove.

4,390,028

OCCLUSION PRESSURE SENSOR

Michiaki Okano, Uji, and Shuhei Furuichi, Shiga, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Mar. 25, 1981, Ser. No. 247,272
Claims priority, application Japan, Mar. 24, 1980, 55-37778
Int. Cl.³ A61B *5/10*
U.S. Cl. 128—777 **8 Claims**



1. A sensor for occlusion pressure comprising:

a complex pressure sensitive element including a rectifying layer and a pressure sensitive layer;

said element changing electric characteristic thereof in response to occlusion pressure by detecting the occlusion pressure of the teeth;

an upside electrode and an underside electrode;

said electrodes being constructed by arranging thin strip pieces or segments in such manner that said strip pieces or segments are arranged in regularly crossing or coordinated relation vertically of said pressure sensitive element on the upside and underside of the element so as to form a plurality of pressure sensitive blocks marked off from one another on the pressure sensitive element; and

an insulating film, said film surrounding and covering said

upside and underside electrodes and said complex pressure sensitive element;

whereby said sensor is constructed to detect an electric signal responsive to occluding points and occlusion pressure from said pressure sensitive blocks by successively electrically scanning the blocks.

4,390,029

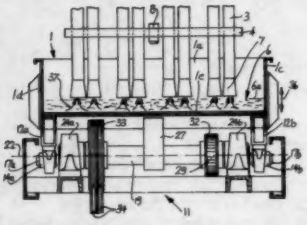
APPARATUS FOR STORING AND TRANSPORTING COMMINUTED TOBACCO OR THE LIKE

Uwe Leckband, Hamburg; Willi Thiele; Klaus Hagenah, both of Geesthacht, and Hans Förster, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 125,230, Feb. 27, 1980, abandoned. This application Mar. 17, 1980, Ser. No. 130,620

Int. Cl.³ A24C *5/02*

U.S. Cl. 131—109 AB **42 Claims**



1. Apparatus for supplying comminuted tobacco or similar particulate material to several consuming machines, especially for supplying shredded tobacco to a plurality of cigarette rod making machines, comprising a storage reservoir; means for feeding comminuted tobacco into said reservoir; means for converting at least the major part of tobacco in said reservoir into a fluidized bed, including means for imparting substantially vertical up-and-down movements to comminuted tobacco in said reservoir; means for pneumatically conveying comminuted tobacco directly from the fluidized bed to selected consuming machines; and means for monitoring the quantity of tobacco in said reservoir, including means for starting said feeding means when the quantity of tobacco in said reservoir drops below a predetermined value.

4,390,030

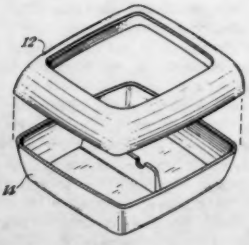
ASHTRAY

Forest S. Tibbetts, 16 SW. 13 St., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 125,215, Feb. 27, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 328,855

Int. Cl.³ A24F *19/00*

U.S. Cl. 131—231 **2 Claims**



1. An ashtray comprising:

a hollow body, said hollow body having an intermediate portion and a lower portion;

said intermediate portion having an upper opening means, said intermediate portion sized and shaped with a cross-sectional area larger than the cross-sectional area of said upper opening,

a holding means sized for completely holding a cigarette below said upper opening means to prevent movement of cigarette out of the ashtray, said holding means connected to said body and positioned below said upper opening means, said upper opening means sized to receive a cigarette completely within said hollow body below said upper opening means;

said upper opening means sized for easy access to a cigarette in said holding means;

said intermediate portion of said hollow body having generally downwardly and outwardly projecting sides, and said lower portion having upwardly and outwardly projecting sides, such that the mid-section of said body has a larger perimeter than any other portion of said body, whereby ashes are prevented from being blown directly out of said ashtray by airflow over said upper opening means.

4,390,031

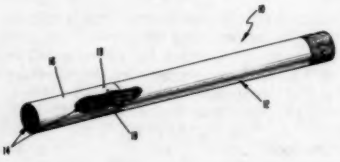
TOBACCO FILTER

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 96,538, Nov. 21, 1979, abandoned. This application Aug. 25, 1981, Ser. No. 296,121

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **9 Claims**



1. A smoke filter including a porous, dimensionally stable, axially elongated, generally cylindrical filter element comprising a continuous filamentary tow of substantially continuous thermoplastic fibers bonded together throughout to be self-sustaining, said fibers being oriented within said filter element in an adjacent and overlapping relation to one another in generally successive layers extending generally transverse to the longitudinal axis of said filter element, the periphery of said element comprising a smooth surface formed from outer edges of said fibers bent about respective axes extending substantially perpendicular to the longitudinal dimension of said element to overlap one another, said filter element having a substantially uniform cross-sectional diameter of approximately 8 mm.

4,390,032

CIGARETTE VENTILATION CONTROL

Francis A. M. Labbe, Neuilly-sur-Seine, France, and Edward G. Preston, London, England, assignors to Molins Limited, London, England

Filed Nov. 26, 1980, Ser. No. 210,814

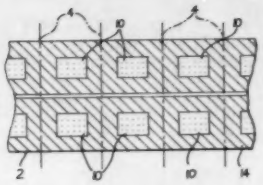
Claims priority, application United Kingdom, Nov. 29, 1979, 7941158

Int. Cl.³ A24C *5/60*

U.S. Cl. 131—281 **27 Claims**

13. Apparatus for manufacturing ventilated cigarettes, including a perforator for producing a group of perforations in cigarettes, means for measuring the resultant dilution of the finished cigarettes, means for generating a signal indicative of

the resultant dilution, and means responsive to said signal for controlling the perforator to alter the distance of the resultant



group of perforations from the mouth end of the cigarette so as to achieve the desired level of dilution.

4,390,033

STABLE HAIR RELAXER

Ezzat N. Khalil, Oak Park, and Ali N. Syed, Hazel Crest, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 202,736, Oct. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,593, Sep. 14, 1979, Pat. No. 4,237,910, which is a continuation-in-part of Ser. No. 34,933, Apr. 30, 1979, abandoned. This application Aug. 25, 1981, Ser. No. 294,911

Int. Cl.³ A45D *7/00*

U.S. Cl. 132—7 **21 Claims**

1. In a no base hair relaxer composition comprising a continuous water phase having dispersed therein about 3 to about 50 weight percent oleaginous material, about 7 to about 25 percent by weight emulsifier and containing a water soluble organic base in sufficient quantity to provide a pH of said composition at about 12–14, wherein the improvement comprises said composition being stabilized against phase separation by about 2 to about 30 weight percent lipophilic, organically modified hectorite clay gellant comprised of hectorite modified with a quaternized nitrogen-containing compound containing at least one C_8–C_{20} long chain substituent on the quaternary nitrogen atom, propylene carbonate and an organic liquid, said weight percents being based upon the total weight of the composition, said oleaginous material, emulsifier and gellant together comprising no more than about 65 percent by weight of the composition.

4,390,034

UNCLOGGING AND RECOVERING DEVICE FOR SLUDGE DEPOSITED ON THE TUBE PLATE OF A STEAM GENERATOR

Louis Bes, Noisy-le-Grand, France, assignor to Framatome, Courbevoie, France

Filed Jun. 30, 1981, Ser. No. 279,284

Claims priority, application France, Jul. 18, 1980, 80 15901

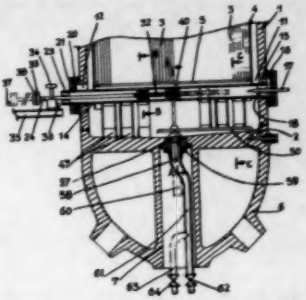
Int. Cl.³ B08B *3/02, 9/02*

U.S. Cl. 134—104 **7 Claims**

1. Device for unclogging and recovering sludge deposited on the tube plate of a steam generator comprising, in a cylindrical vessel with a vertical axis, a vertical bundle of tubes bent into a U connected at each of their lower ends to a horizontal tube plate fast to the vessel of said steam generator and supported at its central part by a vertical hollow column fast to the lower end of said steam generator, a high temperature fluid being brought to the tubes of said bundle beneath said tube plate, to provide the heat enabling vaporization of the feedwater introduced into the upper part of said steam generator in contact with the tubes of said bundle, this feed water causing the deposit of sludge on said tube plate, said device comprising:

(a) a ramp for unclogging by high pressure jets fixed permanently to the inside of said steam generator horizontally and above said tube plate, in a direction diametric to the latter, supplied with water under pressure through a distributor movable inside said ramp in the longitudinal direction of the latter, for the constitution of high pressure jets directed towards said tube plate, at different places according to the length of said ramp;

(b) means for driving towards the center of said tube plate



sludge which is formed during operation and which is stirred up by said water jets; and

(c) a discharge valve for the sludge arranged above an orifice passing through said tube plate at its central part and opening into said hollow central column.

4,390,035

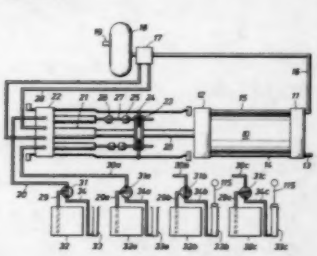
LIQUID MIXING SYSTEMS

Raymond G. Hill, Hill Rd., Victoria, Tex. 77901

Filed Apr. 22, 1981, Ser. No. 256,527

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—99 **8 Claims**



1. A system for mixing liquids in a proportional relationship comprising:

hydraulic motor means having a piston mounted for reciprocation in a cylinder between two longitudinal positions, said piston having a piston rod connected thereto and extending outwardly from said cylinder;

input fluid passage means coupled to an input valve means at each of said longitudinal positions;

output fluid passage means coupled to an output valve means at each of said longitudinal positions;

valve actuating means in said cylinder responsive to the position of said piston in said cylinder at each of said longitudinal positions for actuating said input and an output valve means;

means coupling said valve actuating means in said cylinder to said valve means at each of said longitudinal positions whereby actuation of a pair of input and output valve means by said piston at one longitudinal position also actuates the other pair of input and output valve means located at the other longitudinal position;

pump means having an input fluid means adapted for coupling to a source of mixing liquid and to an output fluid

means, said pump means having a reciprocating means for pumping a mixing liquid from said pump means as a function of the stroke of said reciprocating means;

coupling means for interconnecting said piston rod to said reciprocating means of said pump means; and

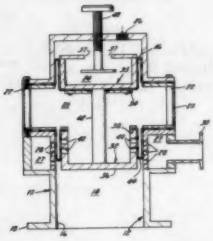
means for interconnecting the output fluid means of said pump means with the output fluid passage means for mixing the fluid outputs with one another.

4,390,036

ROLLING DIAPHRAGM VACUUM CONTROL

Christos Athanassiu, Medford, and Wilfred H. St. Laurent, Jr., Marblehead, both of Mass., assignors to Bellofram Corporation, Burlington, Mass.

Filed Apr. 6, 1981, Ser. No. 251,470
Int. Cl.[3] F16K *7/02, 31/126*
U.S. Cl. 137—116.5 15 Claims



1. A pressure controller for maintaining a defined vacuum pressure to a remote location, comprising:

a. a housing defining a cavity;

b. means for connecting said cavity to said remote location;

c. means for connecting said cavity to a high vacuum;

d. means for connecting said cavity to a control signal pressure;

e. a first plunger, comprising a side wall and a bottom wall, said first plunger defining an opening through its side wall and being adapted to reciprocate inside said cavity;

f. means for sealing between said first plunger and said housing so as to define first and second chambers in said cavity;

g. first valving means for opening and closing fluid communication between said first and second chambers through said opening in said first plunger; and

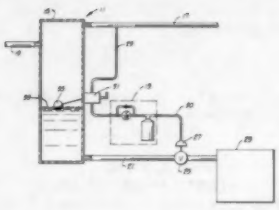
h. second valving means for opening and closing fluid communication between said second chamber and said high vacuum, said sealing means and first and second valving means comprising a flexible diaphragm attached to said housing and to said first plunger such that movement of said first plunger toward said first chamber causes said diaphragm to seal against said side wall of said first plunger, thereby closing fluid communication through said opening in said plunger while opening fluid communication between said second chamber and said high vacuum, and movement of said first plunger toward said second chamber opens fluid communication through said plunger opening and closes fluid communication between said second chamber and said high vacuum by sealing against said housing.

4,390,037

GAS REGULATION DEVICE FOR GAS ACTUATED VALVES

Lawrence B. Perkins, Woodward, Okla., assignor to W. T. Fail, Inc., Shawnee, Okla., a part interest

Continuation of Ser. No. 103,843, Dec. 14, 1979, abandoned.
This application Apr. 23, 1982, Ser. No. 371,242
Int. Cl.[3] B08B *9/02;* F16K *31/18*
U.S. Cl. 137—240 3 Claims



1. A gas and liquid separator comprising:

a separator tank for receiving and holding separated liquid and pressurized gas from a gas and liquid source;

a dump line conduit connecting said separator tank to a liquid reservoir for conveying accumulated liquid from said separator tank to said liquid reservoir;

a gas actuated dump line valve for regulating the flow of liquid through said dump line conduit;

a gas conduit and valve means connected to said dump line valve for actuating said dump line valve by supplying pressurized gas from a pressurized gas source to said dump line valve and relieving pressurized gas from said dump line valve responsive to the liquid level in said separator tank; and

gas conveyance timing means for delaying closing of said dump line valve such that liquid in said dump line conduit is purged by pressurized gas from said separator tank after said dump line valve is opened responsive to said gas conduit and valve means and after the liquid from said separator tank has passed to said liquid reservoir and before said dump line valve is closed responsive to said gas conduit and valve means, said gas conveyance timing means comprising a gas flow limitation device connected to said gas conduit and valve means for limiting gas flow such that gas passes through said gas conduit and valve means for a predetermined time in the process of a gas conveyance which closes said dump line valve.

4,390,038

MAGNETICALLY LOCKED VALVE

Guido A. Salvato, 944 Cathedral Ave., Franklin Square, N.Y. 11010

Filed Feb. 12, 1982, Ser. No. 348,423
Int. Cl.[3] F16K *35/06, 35/16, 31/08*
U.S. Cl. 137—296 6 Claims

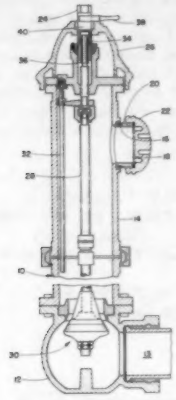
1. A magnetically locked fluid valve, comprising:

a. a valve, including a valve seat, and a valve element movable relative to the valve seat between an open position in which the valve element is separated from the valve seat to allow fluid to flow through the valve, and a closed position in which the valve element is closed against the valve seat to prevent fluid from flowing therethrough;

b. a rotatably mounted valve actuator shaft coupled to said valve element and having an externally accessible and visible operating nut as a portion thereof to allow the valve to be opened and closed when the actuator shaft is coupled to said valve element; and

c. a magnetic locking means positioned below said operating nut and being concealed internally of the magnetically locked valve such that it is not externally visible and being

positioned between; an upper actuator shaft section having said operating nut at the upper end thereof and a lower actuator shaft section coupled to said valve element, for coupling said upper and lower actuator shaft sections to enable said valve element to be opened or closed by said



operating nut when a shaped magnet is properly positioned relative to the upper actuator shaft section, and for decoupling said upper and lower actuator shaft section to prevent unauthorized actuation of said valve element when the shaped magnet is removed fom the upper actuator shaft section.

4,390,039

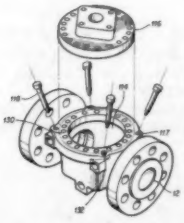
VALVE ASSEMBLY AND DISASSEMBLY DEVICE

David A. Johnson, Shrewsbury; Joseph B. Wright, Northboro, and Michael Pashoogian, Worcester, all of Mass., assignors to Jamesbury Corporation, Worcester, Mass.

Continuation-in-part of Ser. No. 336,686, Jan. 4, 1982. This application Sep. 20, 1982, Ser. No. 420,382

Int. Cl.³ F16K *43/00, 25/00*

U.S. Cl. 137—315 **6 Claims**



1. A valve having a retractable valve seat, including a valve body having an inlet port, an outlet port and an upper opening in a first surface intermediate said inlet and output ports, a cover for closing the upper opening, a valve member for controlling the flow of fluid between the inlet port and outlet port, said valve seat being in contact with the valve member and a central chamber between said inlet port and said outlet port for receiving said valve member, said valve further comprising:

means for retracting said valve seat, said means for retraction being formed of an elongated main section, a forward section and a rear section, said forward section including a camming surface for contacting said valve seat and having a variable diameter as well as a constant diameter portion, said rear section being formed for receiving a force for moving the means for retraction; and

said first surface having holes formed therein for receiving said means for retraction, said holes being formed in a portion of said first surface which is not sealingly covered by said cover, whereby said means for retraction may be inserted in said holes without removing said cover;

wherein said movement of the means for retraction causes the point of said contact of said camming surface to change to a point having said constant diameter, forcing said seat to retract and remain retracted in a locked position by said constant diameter.

4,390,040

APPARATUS FOR ACCOMMODATING A SUBSTANCE TO BE SHIELDED FROM THE ENVIRONMENT

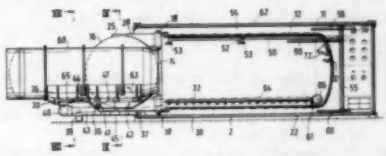
Heinrich Beyen, Wesseling, Fed. Rep. of Germany, assignor to Reederei und Spedition "Braunkohle" GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 30, 1980, Ser. No. 202,147

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944734

Int. Cl.³ B65D *87/12, 87/24*

U.S. Cl. 137—340 **20 Claims**



6. A transportable apparatus for accommodating a receptacle containing a substance to be shielded from the environment, comprising: a container, a substantially cylindrical pressure vessel mounted in said container and having an opening provided at one end, means for sealingly closing said opening, first guide means disposed within said vessel and extending from the opening into said vessel, a carriage for receiving said receptacle and movable on the guide means, and means for locking the carriage in position in said vessel.

4,390,041

PILOT OPERATED RELIEF VALVE

Raymond G. Reip, Clarendon Hills, Ill., assignor to Vapor Corporation, Chicago, Ill.

Continuation of Ser. No. 943,377, Sep. 18, 1978, abandoned. This application Feb. 17, 1981, Ser. No. 233,860

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—488 **4 Claims**

1. A pressure sensitive pilot valve for operating a main pressure relief valve to relieve excess product vapor pressure, having first and second stages in cascade, comprising;

a valve body containing said stages and having first and second inlet ports for sensing product and main valve head pressure, respectively, exhaust and test ports;

a first seat in said body in fluid communication with said first inlet port;

a first stage poppet having first and second positions seated on and restricting flow through said first seat for said first poppet position, below a predetermined value of product pressure and allowing flow therethrough for said second poppet position;

second and third seats in said body;

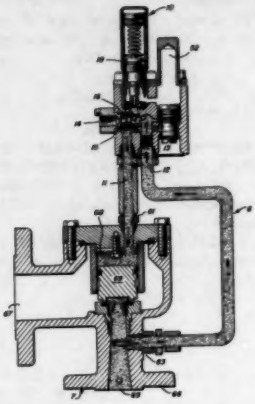
a second stage plunger, having upper and lower ends, reciprocating in said housing, said upper end responsive to first stage flow and movable between said second and third seats for first and second poppet positions respectively;

means fluid communicating said first seat and plunger upper end for said second poppet position;

means communicating said first inlet port and second seat for a first plunger position;

means communicating said second inlet port, exhaust port, and third seat for a second plunger position;

guide means intermediate said first inlet and test port;



a flow sensitive closure member contained in said guide means for reciprocal movement therein, said member sealing said test port or communicating means at either end of said motion;

wherein fluid admitted to said test port and reaching a pressure greater than said product pressure isolates said first seat.

4,390,042

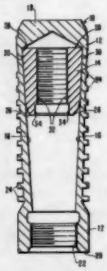
TUBE PLUG

Harvey D. Kucherer, Monroeville; Ralph W. Kugler; Stuart L. Rieben, both of Mt. Lebanon; John J. Wilhelm, New Kensington, and Mark E. Wylie, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1980, Ser. No. 173,550

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—89 **10 Claims**



1. A tube plug for preventing flow through tubes comprising:

a substantially cylindrical shell having one closed end and one open end with said shell having a substantially uniform wall thickness throughout the portion of said shell that contacts said tube and throughout the portion of said tube that is expanded and having a conical inner surface with said conical inner surface having a smaller inside diameter near said open end and having a larger inside diameter near said closed end;

an expander member having a conical outer surface and slidably disposed in said shell with the smaller end of said expander member being arranged nearer said open end of said shell such that said expander member is captured within said shell for expanding said shell when said expander member is moved toward said open end of said shell; and

a plurality of lands formed on the outside surface of said shell with said lands all having approximately the same outside diameter and with said lands increasing in height from said closed end to said open end for contacting the inside surface of said tube when said shell is expanded by said expander member thereby establishing a seal between said tube and said shell.

4,390,043

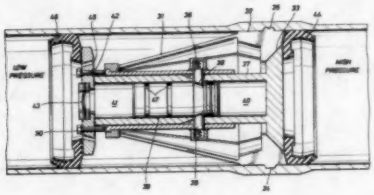
INTERNAL PIPELINE PLUG FOR DEEP SUBSEA OPERATIONS

John M. Ward, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1981, Ser. No. 278,937

Int. Cl.³ F16L *55/10, 1/04*

U.S. Cl. 138—89 **4 Claims**



1. An internal pipeline plug functionable to seal, release and be pumped out of a pipeline comprising, means for sealing the plug in the pipeline to prevent fluid passage around the plug, means for gripping the pipe wall to fix the position of the plug in the pipeline, and pressure release means operable at a set pressure to permit fluid passage into the plug to actuate an axially movable piston operable to release the gripping means from the pipe wall.

4,390,044

RECIPROCATING DEVICE FOR INCREASING THE WEFT DENSITY IN CLOTH WEAVE FABRICS

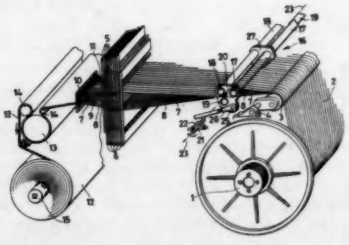
Luciano Corain, Venice, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Nov. 5, 1980, Ser. No. 204,230

Claims priority, application Italy, Nov. 26, 1979, 27545 A/79

Int. Cl.³ D03D *49/00*

U.S. Cl. 139—98 **2 Claims**



1. In a loom construction in which the warp yarns originating from a beam disposed in the rear part of the loom construc-

tion are divided by the heddle frames into two equal sets and which at their front form a shed into which a weft yarn is inserted and is subsequently beaten by a reed, the improvement of a mechanical device for increasing the weft density in cloth weave fabrics produced by said loom construction, said device being mounted in the rear part of the loom construction between said heddle frames and said beam and comprising a pair of parallel forward rollers spaced one above the other in a horizontally disposed relationship and a rear parallel roller rearwardly spaced in a horizontally disposed relationship at the vertices of a triangle formed by the three rollers, said rear roller separating the two equal sets of warp yarns and the pair of forward rollers being positioned in close relationship to one another and function as an outlet guide for the two equal sets of warp yarns, each of said three rollers being rigidly connected at their respective ends to laterally-spaced vertically disposed support plate means, rotational pin means horizontally connected to said loom construction and to support plates to permit the support plate means and the three rollers to rotate about a horizontal axis of rotation, said pin means being connected to said support plates at a point equidistant from the two forward rollers and between the two forward rollers and the rear roller, and drive means connected to said support plate means to reciprocate said support means and said three rollers about the horizontal axis of rotation formed by said pin means.

4,390,045

HEDDLE FRAME STAVE

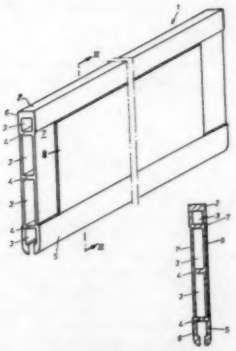
Hans Baumann, Horgen, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Sep. 8, 1980, Ser. No. 184,783

Claims priority, application Switzerland, Sep. 26, 1979, 8671/79

Int. Cl.³ D03D 9/00

U.S. Cl. 139—91 **6 Claims**



1. A heddle frame stave, comprising a light metal, longitudinally extending hollow profile stave of closed cross-section having parallel and substantially flat opposed side walls, at least one of said side walls having a predetermined thickness and an outwardly open recess extending between opposite end walls of said stave and being inwardly spaced from opposite longitudinal walls of said stave, a flat, steel, vibration dampening band being attached by means of a layer of visco-elastic glue to said one side wall within said recess, the width of said band, which extends perpendicularly to said longitudinal walls being substantially the same as the width of said recess which likewise extends perpendicularly to said longitudinal walls, said band covering at least about 60% of the surface of said side wall and having a thickness of less than half said predetermined thickness of said one side wall, and the depth of said recess being substantially equal to said band thickness, whereby any vibration of the heddle frame during operation is substantially dampened together with any noise development.

4,390,046

APPARATUS FOR MANUFACTURING WOVEN SLIDE FASTENER STRINGERS

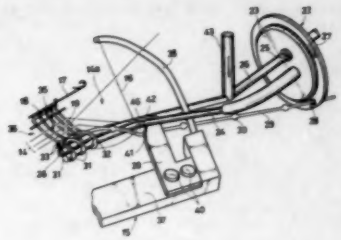
Muchiji Shimono, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,584

Claims priority, application Japan, Mar. 25, 1980, 55-39388[U]

Int. Cl.³ D03D 47/00

U.S. Cl. 139—442 **3 Claims**



1. An apparatus for manufacturing woven slide fastener stringers, comprising:

(a) means for forming successive sheds with a plurality of warp threads;

(b) a coiling mechanism including a mandrel for extending substantially along the warp threads on one side thereof and a rotor for revolving a monofilament of synthetic resin around said mandrel in a conical orbit to form a series of coiled coupling elements; and

(c) a weft inserter disposed on said one side of the warp threads and reciprocable across the conical orbit and one of the sheds at a time for inserting a weft thread into the shed, by which the coiled coupling elements can be woven into a stringer tape along a longitudinal edge thereof as the tape is woven of the warp and weft threads, said weft inserter including an arm movable upon weft insertion in between said mandrel and the monofilament and engageable with the monofilament being coiled to displace the latter out of the path of insertion of the weft thread for allowing the latter to be inserted unobstructedly.

4,390,047

TOOL FOR STRAP TENSIONING AND CUTTING

Hogara Kaneko, 3-2-302, Zengyo Danchi, Fujisawa City, Japan

Filed Sep. 11, 1980, Ser. No. 185,780

Claims priority, application Japan, Sep. 29, 1979, 54-125509

Int. Cl.³ B21F 9/02

U.S. Cl. 140—93.2 **5 Claims**

1. A tool for tensioning a bundling strap about a bundle of wires comprising:

a hollow body having an inner surface functioning as a first plate defining a major axis including a hollow grip dependent therefrom and integral therewith at a rear portion of said body;

a second plate attached adjacent said body including a forward bent portion having a strap insertion slit therein, and a rest cam at a middle portion thereof;

a third plate carried by said second plate, said third plate being supported on said rest cam for sliding motion relative thereto and along said major axis, said third plate including hook means at a forward end thereof normally positioned rearwardly of said second plate bent portion, and a return projection at a middle portion thereof;

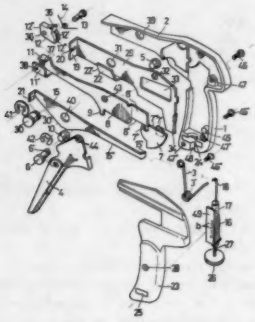
a fourth plate pivotably mounted at a middle portion thereof to said body, the forward portion of said fourth plate including a cutting edge, said fourth plate being disposed adjacent said third plate with said cutting edge being located rearwardly of said second plate bent portion;

a nipping member pivotally carried by said third plate hook means and being biased toward said bent portion for coaction with said hook means to grasp said bundling strap therebetween;

a handle pivotably attached at its upper end to said body;

an actuator member engaging an intermediate portion of said handle, said actuator member being pivotally attached to said third plate with said return projection of said third plate being arranged for contacting said handle and said actuator member arranged for coaction with said fourth plate;

first spring means normally biasing said third plate forwardly and developing a predetermined first force;



second spring means having one end engaging the rear portion of said fourth plate, normally biasing said cutting edge into a raised position relative to said strap insertion slit in said second plate and normally developing a second predetermined force acting substantially normal to said first force;

so that upon insertion of a cable strap in said second plate slit and pivoting of said handle toward the grip of said body, the third plate slides rearwardly in opposition to said first predetermined force, and the nipping member rotates to hold the strap against the hook means and tighten it around the bundle of wire, so that when the strap is fully tightened aout the bundle, the third plate ceases its movement so that further pivoting of the handle causes the actuator to rotate into engagement with the fourth plate thereby causing the fourth plate to rotate against the second predetermined force until the cutting edge cuts the strap and releases the third plate for renewed rearward movement.

4,390,048

METHOD AND DEVICE FOR RECOVERING AN INERT GAS

Felix Zelder, Langenlonsheim, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,717

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024099

Int. Cl.[3] **B65B** *55/24;* **B67C** *3/06*

U.S. Cl. 141—6 **36 Claims**

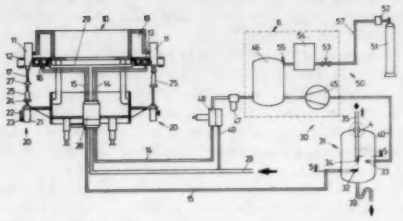
1. A method of recovering inert gas used during a filling process for pressurizing containers which are to be filled with a liquid, said method including the steps of:

expelling the air found in a container, and pressurizing said container, with a mixture of air and heavy inert gas;

filling said container with said liquid and thus expelling said pressurizing gas mixture;

centrally collecting said expelled gas mixture from a plurality of containers and conveying said mixture to at least one accumulator;

subjecting said pressurizing gas mixture in said at least one accumulator to at least one gravity effect for partially



separating off the lighter gas components and producing a mixture of predominantly inert gas;

adding additional inert gas to said mixture of predominantly inert gas; and

returning the resulting mixture to said filling process, at least as a pressurizing gas mixture, for use with subsequent containers which are to be filled.

4,390,049

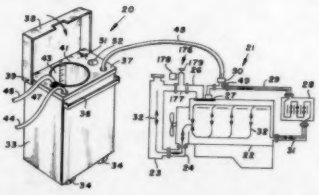
APPARATUS FOR RECIPROCATING LIQUID IN A COOLING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Division of Ser. No. 908,273, May 22, 1978, Pat. No. 4,276,914. This application Dec. 11, 1980, Ser. No. 215,365

Int. Cl.[3] **B65B** *3/12;* **B08B** *9/00*

U.S. Cl. 141—92 **31 Claims**

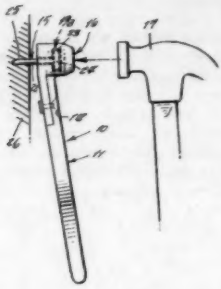


17. An apparatus for sequentially delivering forward and reverse moving liquid to a structure accommodating a liquid comprising: pump means operable to move a liquid sequentially in forward and reverse directions, first means having a first chamber, a second chamber, and a one-way valve allowing liquid to flow in a forward direction from the first chamber to the second chamber, second means connected to the pump means and first means for carrying liquid from the pump means to the first chamber of the first means, third means connected to the first means for receiving liquid from the second chamber adapted to be connected to the structure accommodating a liquid to deliver said liquid to the structure, and fourth means connected to the first means in liquid communication with the first and second chambers to carry liquid from the second chamber to the first chamber by-passing said one-way valve, whereby operation of the pump means causes sequential movement of the liquid in forward and reverse directions in the structure accommodating a liquid.

4,390,050
TACK PLIERS

LeRoy E. Whitney, Rt. 2, Box 590, Newcastle, Wyo. 82701

Filed Aug. 5, 1981, Ser. No. 290,158
Int. Cl.³ B25C 3/00
U.S. Cl. 145—46 1 Claim



1. A tack pliers, comprising: an elongated pair of crossing levers; a rivet located at the crossing point of said levers and forming a pivot therebetween; cooperative handles formed at one end of said levers, and cooperating jaws formed at the other end of said levers, each jaw comprising a semicylindrical body member, a flat top surface, a parallel flat bottom surface, and a flat diametric surface interconnecting said top and bottom surfaces and substantially perpendicular thereto, a first semicylindrical hole coaxial with said body member formed into said diametric surface at a location between said bottom and top surfaces, a second semicylindrical hole coaxial with said body member formed into said diametric surface commencing at said bottom surface and terminating into said first semicylindrical hole, said second semicylindrical hole being smaller than said first semicylindrical hole, both said jaws being substantially identical such that once said diametric surfaces are brought into abutting relationship a generally cylindrical assembly is formed, said second cylindrical holes mating to form a cylindrical aperture for receiving the shank portion of a nail, said first semicylindrical holes mating to form a cylindrical groove for receiving the head portion of a nail, said top surfaces meeting to form a coplanar end wall which can be struck by a hammer, said bottom surfaces meeting to form a coplanar lower wall, said jaws being substantially short with respect to the length of said levers, the axis of said formed cylindrical assembly being substantially perpendicular to said levers, and wherein said handles bend away from the plane of said lower wall.

4,390,051
SECURING A LINER WITHIN A FLEXIBLE CONTAINER

Bruce Cuthbertson, Macon, Ga., assignor to Bonar Industries Inc., Macon, Ga.

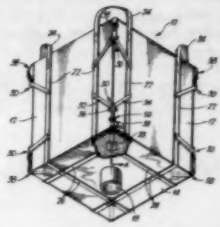
Filed Apr. 3, 1981, Ser. No. 250,605
Int. Cl.³ B65D 90/04, 90/08, 90/20
U.S. Cl. 150—1 12 Claims

1. For use in an intermediate bulk container including at least side walls having upper and lower peripheries respectively and a bottom wall, the improvement in releasably mounting a liner internally of said container comprising:

a plurality of first attachment means secured externally to the side walls of the container adjacent the upper and lower peripheries thereof, and spaced uniformly around said container;

a plurality of first openings through said container adjacent said bottom wall, there being one opening associated with each first attachment means adjacent said lower periphery; and

a plurality of second attachment means secured to said liner adjacent the top and bottom thereof, there being one second attachment means for each first attachment means; whereby, with said liner located within said container each

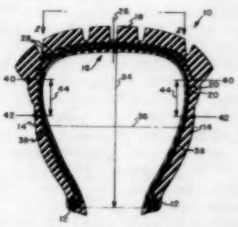


of said second attachment means can extend from the interior of the container to the exterior thereof and can be releasably secured to a corresponding one of said first attachment means.

4,390,052
MOTORCYCLE TIRE

Joseph V. Mendiola, Ravenna, and David E. Smith, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 17, 1981, Ser. No. 255,010
Int. Cl.³ B60C 9/18, 9/04
U.S. Cl. 152—356 R 8 Claims



1. A bias-belted motorcycle tire comprising: a pair of beads; a carcass extending between the beads, said carcass comprising two or more plies of reinforcing cords which extend at a cord angle, relative to and at the mid-circumferential plane of the tire, which is not greater than about 75 degrees, the cords of one ply extending at the same angle but in an opposed direction to the cords of the other ply; a tread disposed outwardly of the carcass, said tread having tread edges; a pair of sidewalls extending from the tread edges to the respective beads; two or more belts disposed between the tread and the carcass plies to provide a restricting force on the carcass plies, said belts comprising reinforcing cords which extend at a cord angle, relative to and at the mid-circumferential plane of the tire, which is at least 2 degrees less than the cord angle of the reinforcing cords of the plies of said carcass, the reinforcing cords of said belts extending at equal but opposed cord angles; and a sidewall stiffening means extending from each bead and terminating in the respective sidewall a distance from the respective bead equal to between about 40 and about 60 percent of the section height of the tire, and at least one of said belts extending across the width of said tread and terminating at a location which is spaced in the radial direction from the radially outermost portion of said sidewall stiffening means a distance which is equal to at least about one-half inch, but not more than about one inch, to provide a flex zone wherein the sidewalls are

devoid of any reinforcement other than the reinforcement provided by the carcass.

4,390,053

ANTI-SLIP CHAIN FOR VEHICLE TIRES

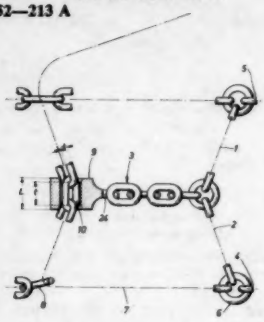
Hansjörg Rieger, Aalen, and Dietmar Holzwarth, Schwäbisch-Gmünd, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger 6 Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Aug. 9, 1981, Ser. No. 301,758

Claims priority, application Switzerland, Sep. 18, 1980, 7020/80

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 A 12 Claims



1. In an anti-slip chain for vehicle tires of the type having a running net including track pieces formed by chain strands connected to cross-chains extending at an angle to the direction of rotation, said cross-chains being held by an inner and an outer holding device, and in which a tensioning chain strand being attached to one end of the inner holding device and serving to tension said inner holding device is led from the inner holding device at an angle to the direction of rotation over the tread to the outer holding device, said tensioning chain strand passing through a guide element attached to one end of a track piece, the other end of said track piece being connected to said cross-chains,

the improvement comprising:

said guide element being formed by a sliding sleeve (9;11) the length of which is greater than the difference of the pitch t of the links (10) of the tensioning chain strand (7) and the link wire diameter d of these links.

4,390,054

APPARATUS FOR OPENING AND CLOSING A FLEXIBLE SCREEN IN A GREENHOUSE OR THE LIKE

Kenji Niibori, and Toshio Ishihama, both of Oyama, Japan, assignors to Seiwa Kagaku Kabushiki Kaisha, Japan

Filed Jul. 8, 1981, Ser. No. 281,409

Claims priority, application Japan, Jul. 9, 1980, 55-96769[U]; Oct. 23, 1980, 55-151292[U]

Int. Cl.³ A47H *1/00*

U.S. Cl. 160—265 4 Claims

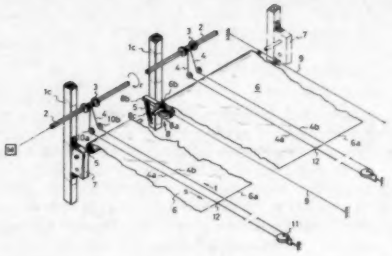
1. Apparatus for opening and closing a flexible screen of a greenhouse or the like of the type wherein an end edge of the flexible screen is fixed to a winding rod and wherein the screen is opened or closed by winding the screen onto the winding rod or unwinding the screen from the winding rod respectively, comprising:

an elongated winding rod mounted for rotation about a fixed axis of rotation, said elongated winding rod having alternating large diameter and reduced diameter portions;

an elongated flexible screen fixed at an end edge thereof to said winding rod and windable thereon to form a rolled screen;

rolled screen supporting means for supporting the rolled screen wound on said winding rod including a casing defining an opening for receiving said rolled screen and a screen delivering slit, a plurality of rolled screen supporting rollers rotatably supported in said casing and arranged to support said rolled screen in said opening along the periphery thereof, and rollers provided in the region of said screen delivering slit for guiding said screen which passes therethrough;

traction means operatively connected to the other end edge of said flexible screen for selectively pulling said flexible screen in either one of opening and closing directions, said traction means including an elongated driving shaft mounted for rotation about a fixed axis of rotation, second driving means for selectively rotating said driving shaft in either one of normal and reverse directions, elongated flexible members each of which has its two ends secured to said driving shaft with respective end portions thereof being coiled on said driving shaft opposite to each other,



guide means for guiding two portions of each of said flexible members over a predetermined path of travel, and wherein each of said flexible members is operatively connected at one of said two portions thereof to said flexible screen; and

first driving means for constantly applying a substantially constant restoring force to said winding rod tending to rotate the same about its fixed axis of rotation in a direction such that said flexible screen would be wound onto said winding rod, said first driving means including a casing, a constant-restoring-force spring housed in said casing, an output shaft rotatably supported in said casing, said spring being coiled thereon with an end of said spring being fixed to said output shaft, and a main shaft rotatably supported in said casing and having coiled thereon the other free end of said spring, and wherein at least one end of said winding rod is operatively connected to said output shaft.

4,390,055

DRAPERY CARRIER

Joel S. Fenley, Union Lake, Mich., assignor to Saf-T-Trac Company, Detroit, Mich.

Filed Aug. 6, 1980, Ser. No. 175,782

Int. Cl.³ A47H *13/14*

U.S. Cl. 160—348 2 Claims

1. A drapery system comprising:

a sheet of flexible drapery material;

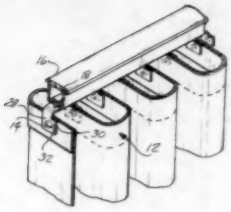
a narrow elongated strip formed of a resilient sheet material secured to an elongated edge of the drapery material;

spaced pairs of separable fasteners of a first form secured at spaced intervals along the strip;

an elongated drapery rod;

a plurality of carriers each having a first section adapted to be slidably supported on the rod and a second section depending below the rod, each second section supporting a pair of separate separable fasteners of a second form, complementary to the first form, spaced relative to one

another along a line parallel to the length of the rod, the distance between the pair of separable fasteners secured to the second section of each carrier being less than the distance between the two members of each pair of separable fasteners of the first form which are secured to the strip, the lower section of each carrier including a pair of substantially planar surfaces each extending normally to the axis of the rod, the two surfaces being spaced from one another along the axis of the rod, the two planar surfaces formed on the lower section of each carrier being formed by a pair of plates having their upper edges secured to the bottom of the upper sections of each carrier so that the plates project downwardly therefrom to define a downwardly opening passage therebetween, and the two separable fastener sections of the first form being supported one on each of said planar surfaces, whereby the drapery sections carrying said separable fasteners of the first form will be supported laterally to the axis of the rod;



whereby each pair of separable fasteners formed on the strip may be joined to the pair of separable fasteners formed on the second section of a carrier so that the section of the strip between each pair of separable fasteners forms a curved section extending laterally in a first direction from the carrier and the sections of the strip between adjacent carriers extend laterally from the carriers in a second direction to form a roll pleat, said separable fastener of the second form being formed in said plates so as to allow attachment of the fasteners of the first form to either side of the plate.

4,390,056

METHOD AND APPARATUS FOR PRODUCING ONE OR MORE HOLLOW SAND CORES SUITABLE FOR CASTING MOULDS

Morgens W. Grove, Bronshoj, and Carl-Erik Eriksen, Ballerup, both of Denmark, assignors to Dansk Industri Syndikat A/S, Herlev, Denmark

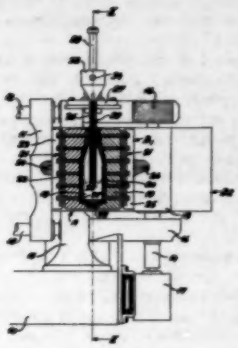
Continuation of Ser. No. 946,618, Sep. 28, 1978, abandoned, which is a continuation of Ser. No. 700,598, Jun. 28, 1976, abandoned. This application Jul. 30, 1980, Ser. No. 173,753
Claims priority, application Denmark, Jul. 27, 1975, 2920/75
Int. Cl.³ B22C *13/08, 13/12*
U.S. Cl. 164—7.1 **6 Claims**

1. A method for producing one or more hollow sand cores suitable for casting moulds by means of a bipartite core box (A, B) defining a mould cavity having an interior with bottom and side surfaces into which sand, binder, and catalyst or a curing agent are introduced comprising the steps of:

(1) establishing a pressure gradient which decreases from the interior to the exterior of a non-heated core box (A, B) of porous material, at least a portion of the porous material being coarse so that the pressure gradient is readily transmitted through walls of the core box,

(2) introducing sand, binder, and a catalyst or a curing agent into the mould cavity defined by said non-heated core box (A, B), the sand being introduced into the mould cavity as a layer of sand on the outside of a porous pipe and being retained thereon by means of vacuum maintained in the interior of the pipe,

(3) directing the introduced sand, binder, and catalyst or curing agent against the side surfaces of the interior of the non-heated core box (A, B) which step of directing, at least in part, is obtained by the pressure gradient established between the interior and exterior of the non-heated core box (A, B), and by abruptly replacing the vacuum in the pipe by an overpressure whereupon the sand is blown against the interior surface of the non-heated core box, and



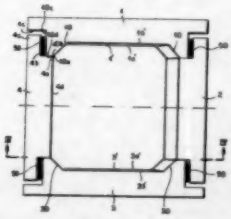
(4) using the pressure gradient to hold the introduced sand, binder, and catalyst or curing agent against the side surfaces of the interior while they solidify to form the hollow sand core.

4,390,057

CURVED CONTINUOUS-CASTING MOLD AND METHOD OF REESTABLISHING THE INTERNAL DIMENSIONS THEREOF

Hans-Josef Reuter, Kürten-Biesfeld, Fed. Rep. of Germany, assignor to Mecan Arbed S.A., Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 215,153, Dec. 11, 1980, abandoned. This application Apr. 30, 1981, Ser. No. 259,093
Claims priority, application Luxembourg, Dec. 11, 1979, 81982
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—459 **5 Claims**



1. A mold for curved-mold continuous casting comprising mold plates defining a mold channel curving and converging in a casting direction, each of said plates being formed with a recessed edge portion interfitting with a respective portion of an angularly adjoining plate at a corner of the channel wherein each pair of angularly adjoining plates have abutment surfaces in contact with one another over the length of the mold and defining joints between the plates of each pair, said each pair of angularly adjoining plates further having a first and a second pairs of confronting flange surfaces spaced from one another, said plates including a first pair of mutually opposite plates having substantially flat inner surfaces extending in said direc-

tion, and a second pair of opposite plates with curved inner surfaces, the plates of one of said first and second pairs being formed along their edges with internal bevels, said bevels and the inner surfaces of said plates imparting an octagonal cross-section to said channel, progressively reducing in the casting direction, a plurality of shims being disposed between the first pair of said confronting flange surfaces of each pair of angularly adjoining plates externally of said channel to position edges of the respective abutment sufaces flush with one another at the respective joint.

5. A method of restoring an original configuration and dimension of a channel of a mold defined by inner surfaces of pairs of opposite plates having abutment surfaces adjoining each other at corners and confronting flange surfaces interposed by groups of shims, some of said plates having internal bevels, said method comprising the steps of:

removing material of a thickness "a" from the inner surfaces and abutment surfaces of the plates provided with said bevels and of a thickness a-cos α from said bevels, where α is the bevel angle;

removing material of a thickness "b" from the inner surfaces of the plates which are not provided with said bevels; and

withdrawing shims at each corner with a total thickness "b", where "b" can be the same or different from "a"; and

bringing the plates into mutual contact until the respective abutment surfaces flush with one another at a respective joint.

4,390,058

METHOD OF MONITORING CONDENSER PERFORMANCE AND SYSTEM THEREFOR

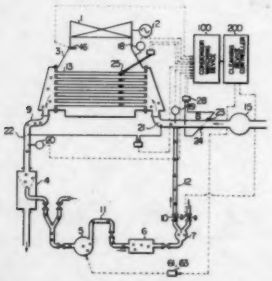
Katsumoto Otake, Hitachi; Masahiko Miyai, Mito; Yasuteru Mukai, and Isao Okouchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,095

Claims priority, application Japan, Dec. 5, 1979, 54-156907

Int. Cl.³ F28G *13/00*; F28F *27/00*; F28B *9/00, 11/00*

U.S. Cl. 165—1 **32 Claims**



1. A method of monitoring the performance of a condenser comprising the steps of:

sensing the operating conditions of the condenser and obtaining values representing the operating conditions;

calculating the cleanness of cooling water tubes of the condenser based on at least one of the variables of the overall condenser heat transmission coefficient and a heat transfer rate according to the values obtained in the first step; and

controlling the performance of the condenser with special reference to the values representing the cleanness of the cooling water tubes.

4,390,059

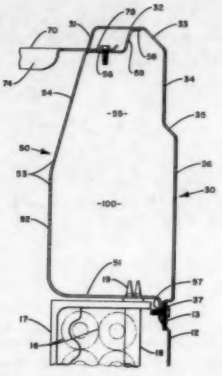
HEAT EXCHANGER AND FAN AND METHOD OF ASSEMBLY

Rudy E. Haas, East Syracuse; Michael E. Smorol, Syracuse; Curtis L. Tobin, Chittenango, all of N.Y., and James J. Walker, Jr., Merrimack, N.H., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 3, 1980, Ser. No. 202,981

Int. Cl.³ F28F *9/24*

U.S. Cl. 165—76 **5 Claims**



1. A heat exchange unit having a heat exchanger and a fan for circulating air in heat exchange relation with the heat exchanger which comprises:

an annular fan orifice defining a top discharge air flow path through a portion of the heat exchange unit, said orifice including a grille support ledge and a top cover support ledge;

a grille adapted to cover the air flow path through the fan orifice, said grille including an annular solid edge portion which mates with the grille support ledge of the fan orifice to secure the grille relative to the fan orifice; and

a top cover adapted to encase the fan orifice, said top cover including a top portion which defines a top surface of the heat exchange unit and mates with the top cover support ledge of the fan orifice to affix the top cover relative to the fan orifice and which includes a securing flange for covering a part of the edge portion of the grille.

4,390,060

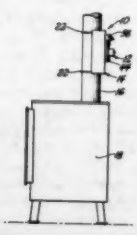
AIR-CIRCULATING ASSEMBLY

Nelson A. Reinke, 10300 Cathleen Dr., and B. G. Ulch, 287 Oak St., both of Harrison, Mich. 48625

Filed Jul. 20, 1981, Ser. No. 285,430

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—76 **10 Claims**



1. An air-circulating assembly (10) comprising; fan means (12), shroud means (14) for supporting said fan means (12), and

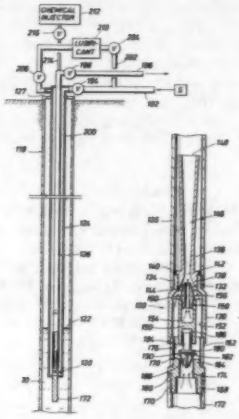
said assembly characterized by support means for extending about and engaging an existing stove pipe (16) for removably attaching said shroud means (14) to the exterior of the stove pipe (16) for moving ambient air past the stove pipe (16) to heat the ambient air from the stove pipe (16), and said support means including a cradle (20) for engaging one side of the stove pipe (16) and at least one flexible member (22) attached to said cradle (20) and extending around the remainder of the pipe (16) to hold said cradle (20) against the pipe (16).

4,390,061

APPARATUS FOR PRODUCTION OF LIQUID FROM WELLS

Charles Short, P.O. Box 629, Humble, Tex. 77338

Filed Dec. 31, 1980, Ser. No. 221,534
Int. Cl.³ E21B *43/00, 43/34;* F04F *5/12, 5/44*
U.S. Cl. 166—53 **18 Claims**



1. Apparatus for production of liquid from a subsurface formation intersected by a well bore said apparatus comprising:

a string of production tubing extending into said well bore and into liquid standing within said well bore;

aspirator means being interconnected with said production tubing and being positioned below the level of liquid standing within said well, said aspirator means defining an aspirator housing secured to said production tubing, said aspirator housing defining a gas injection section in communication with said gas supply means, said gas injection section defining a liquid flow path in communication with liquid standing within said well and a gas flow path, said gas injection further defining a valve retainer;

a valve housing being interconnected with said aspirator housing and defining a valve seat;

a valve element being movably received by said valve retainer and being movable to open and closed positions responsive to conditions of liquid flow within said liquid path, said valve element being at least partially receivable within said valve seat, said valve retainer and valve housing providing guiding support for said valve element;

an upwardly directed nozzle being defined by said aspirator means and defining a restricted gas jet passage being the terminal portion of said gas flow path;

gas supply means communicating a pressurized gaseous medium from a gas supply source to said gas flow path; and

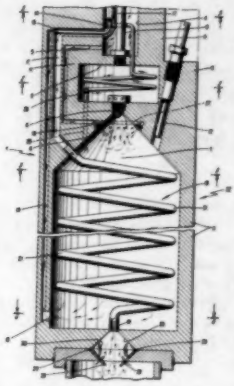
venturi means being defined within said aspirator means and being in communication with said liquid flow path, said gas jet passage and said liquid flow passage means having confluence with said venturi means and terminating within said venturi means, said gas jet passage directing a jet of compressed gas upwardly through said venturi means and causing liquid within said liquid flow path to flow upwardly into said venturi means and become aspirated and thus transported upwardly through said production tubing for production at the surface.

4,390,062

DOWNHOLE STEAM GENERATOR USING LOW PRESSURE FUEL AND AIR SUPPLY

Ronald L. Fox, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 7, 1981, Ser. No. 222,863
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—59 **4 Claims**



1. An apparatus for generation of steam in a borehole for penetration into an earth formation, comprising

an oxidant supply means;

a fuel supply means for supplying fuel;

an igniter means for igniting the fuel and oxidant mixture;

a water supply means for providing water to be converted to superheated water by the heat of combustion;

a combustor assembly having oxidant inlet means, fuel inlet means, a combustion chamber for generating hot combustion gases, a heat exchanger in said combustion chamber for at least superheating the water while maintaining separation between said water and the hot combustion gases, and nozzle means connected to said heat exchanger for converting the superheated water into steam and ejecting the steam into the borehole;

exhaust means connected to said combustion chamber for venting the hot gases of combustion out of the combustor assembly wherein said exhaust means includes an exhaust pipe, and said water supply means includes a water line, said exhaust pipe being mounted in said water line thereby serving to preheat the water before entry into said heat exchanger.

4,390,063

GEOTHERMAL WELLHEAD PACKING ASSEMBLY

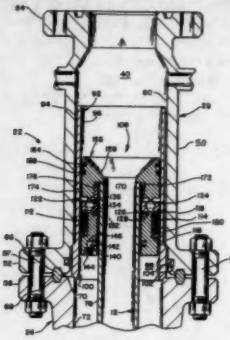
Frederic D. Wells, Jr., Shreveport, La., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed May 20, 1981, Ser. No. 265,310
Int. Cl.³ E21B *33/03;* F16L *17/02, 21/04, 27/12*
U.S. Cl. 166—84 **30 Claims**

1. In a wellhead assembly having a casing head, an inner casing within the casing head, the inner casing having a restrained lower end portion and an unrestrained upper end portion extending above the casing head, and an expansion

spool mounted on the upper end of the casing head and receiving the upper end portion of the inner casing:

an expansion sleeve fitting within the expansion spool, the outer surface of the expansion sleeve being adjacent the inner surface of the expansion spool and defining an annular space between the inner surface of the expansion sleeve and the outer surface of the inner casing;



and a packing assembly mounted within the annular space on the upper end portion of the inner casing and extending in sealing relation between the inner casing and the expansion sleeve, said packing assembly being movable with the upper end portion of the inner casing relative to the expansion spool and expansion sleeve as the inner casing moves longitudinally in response to temperature changes within the wellhead assembly.

4,390,064

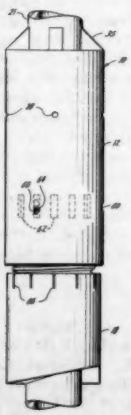
JUNK BASKET

Jack Enen, Jr., Dallas, and Wayne M. Sullivan, Houston, both of Tex., assignors to Enen Machine Tool & Equipment Co., Dallas, Tex.

Filed Oct. 17, 1980, Ser. No. 197,862

Int. Cl.³ E21B *31/08*

U.S. Cl. 166—99 **5 Claims**



1. A junk basket for collecting junk from a well bore and adapted for connection to a well drilling string comprising,

an elongate body having an annular interior for attachment to the exterior of a portion of a drilling string,

said body including an upwardly directed cavity for receiving junk from the well bore,

drain holes through the body adjacent the bottom of the cavity for draining fluids from the cavity,

ribs in the cavity connected to the body and adapted to engage the exterior of the drilling string for reinforcing the body,

tapered guide means extending upwardly from the top of the ribs for preventing the top of the body from catching on downwardly facing shoulders in the well bore,

means connected to the body for releasably connecting the body to the exterior of the drilling string including,

a downwardly facing annular shoulder in the interior of the body,

a resilient male split ring positioned in the interior of the body against the shoulder,

a resilient female split ring positioned in the interior of the body against the male ring,

said male and female split rings having coacting conical surfaces whereby axial movement of the rings toward each other causes the male ring to clamp on the exterior of the drilling string, and

an end cap threadedly connected to the body, said end cap interlocked with the female split ring whereby rotational movement of the cap relative to the body causes axial movement of the rings relative to each other.

4,390,065

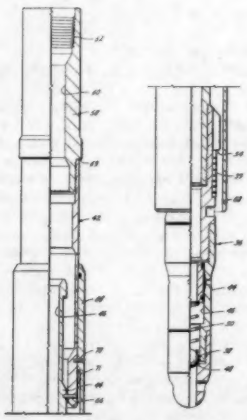
APPARATUS FOR WELL TREATING

Charles N. Richardson, New London, Tex., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Division of Ser. No. 179,487, Aug. 19, 1980, Pat. No. 4,314,608, which is a continuation-in-part of Ser. No. 158,889, Jun. 12, 1980, abandoned. This application Sep. 17, 1981, Ser. No. 303,191

Int. Cl.³ E21B *33/12, 33/14*

U.S. Cl. 166—181 **2 Claims**



1. An apparatus for performing well treating operations comprising:

a retrievable fluid plug comprising,

a generally cylindrical body having a fluid passageway extending vertically therethrough,

check valve means in said passageway for preventing fluid flow downwardly therethrough, while permitting fluid flow upwardly therethrough,

latch engaging means formed on the upper end of said body for selective engagement by the latch means of a valve retrieving mechanism,

seal means disposed about the outside of said cylindrical body and adapted to engage the bore of a packer, and

pressure equalizing means for selectively permitting fluid in said fluid passageway to bypass said check valve means to thereby equalize the pressure above and below said retrievable fluid plug; and

a seating mechanism releasably attached to said retrievable fluid plug, said seating mechanism comprising,

a generally cylindrical body having a bore extending vetically therethrough and having a threaded connection at the upper end thereof for threadedly attaching said seating mechanim to a tubing string, and

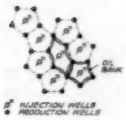
means for releasably attaching said seating mechanism to said retrievable fluid plug means.

4,390,066

WELL LOCATION PATTERN FOR SECONDARY AND TERTIARY RECOVERY

J. Scott Moore, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 5, 1981, Ser. No. 231,814
Int. Cl.³ E21B *43/30*
U.S. Cl. 166—245 **6 Claims**



1. A method of producing hydrocarbons from a subterranean formation comprising:

penetrating said formation with a plurality of wells arranged in a pattern defining a series of replicating regular pentagons with an injection well at the center of each pentagon and production wells at the corners of each pentagon;

injecting a fluid into said formation by way of the injection wells whereby hydrocarbons contained in said formation are displaced from the injection wells toward the production wells in said pattern; and

producing said hydrocarbons by way of said production wells.

4,390,067

METHOD OF TREATING RESERVOIRS CONTAINING VERY VISCOUS CRUDE OIL OR BITUMEN

Bertram T. Willman, Calgary, Canada, assignor to Exxon Production Research Co., Houston, Tex.

Filed Apr. 6, 1981, Ser. No. 251,587
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—245 **21 Claims**

1. A method for treating a field having a reservoir containing viscous oil or bitumen comprising the steps of:

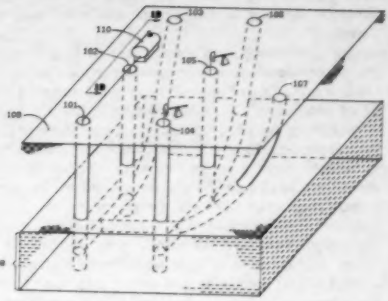
providing at least two boreholes extending downward from the surface at least into the reservoir,

providing at least one generally horizontal borehole within the reservoir connecting at least two boreholes extending from the surface,

introducing a heated fluid into said horizontal borehole in an amount sufficient to at least soften said viscous oil or bitumen for a distance substantially along said at least one generally horizontal borehole within the reservoir,

substantially plugging said at least one horizontal borehole within the reservoir,

introducing a heated displacement fluid into at least one borehole extending downward from the surface within the reservoir at the juncture between the plugged borehole said downwardly extending borehole, and



withdrawing said viscous oil or bitumen from a borehole extending downward from the surface at a point remote from the displacement fluid introduction point.

4,390,068

CARBON DIOXIDE STIMULATED OIL RECOVERY PROCESS

John T. Patton, Las Cruces, N. Mex., and Carl M. Canfield, Littleton, Colo., assignors to Champlin Petroleum Company, Wilmington, Calif.

Filed Apr. 3, 1981, Ser. No. 250,894
Int. Cl.³ E21B *43/22, 43/40*
U.S. Cl. 166—267 **18 Claims**

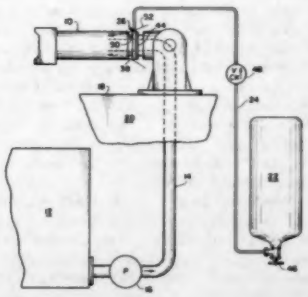
1. A process of stimulating oil recovery comprising introducing carbon dioxide in the liquid state into an underground formation containing crude oil, permitting said carbon dioxide to be absorbed by said crude oil, and maintaining a back pressure in the range of from atmospheric to approximately 300 psi on said formation while withdrawing said crude oil containing carbon dioxide absorbed therein.

4,390,069

TRIFLUOROBROMOMETHANE FOAM FIRE FIGHTING SYSTEM

George R. Rose, Jr., East Patchogue, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 80,446, Oct. 1, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,693
Int. Cl.³ A62C *35/02, 5/04*
U.S. Cl. 169—15 **1 Claim**



1. Apparatus for fighting fires comprising, in combination:

means for supplying an aqueous liquid under pressure to a discharge opening;

nozzle means at said discharge opening, said nozzle means having a discharge orifice and, upstream therefrom, an air induction opening around the periphery of said nozzle means;

metering means supported around said air induction opening, said metering means comprising an annular metering collar having spaced around the annulus thereof a plurality of metering nozzles whose output is directed into said air induction opening, said metering means passing a trifluorobromomethane (CF_3Br) compound from a supply receptacle under pressure into said aqueous liquid such that said mixed liquid and said compound are projected as a foam onto a fire from said nozzle means, the trifluorobromomethane compound mixed in said liquid expanding upon passage through said nozzle means to generate a gas in the bubbles of said foam whereby said compound is carried in said bubbles to said fire by said foam such that the subsequent bursting of said bubbles releases said compound to act on said fire and thereby further the fire extinguishing action of said foam.

4,390,070

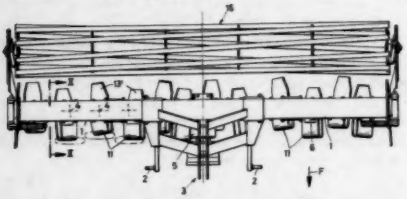
SOIL WORKING MACHINE

Bruno Barlage, Riesenbeck, Fed. Rep. of Germany, assignor to H. Niemeyer Sohne GmbH & Co. KG, Riesenbeck, Fed. Rep. of Germany

Continuation of Ser. No. 81,993, Oct. 4, 1979, abandoned. This application May 26, 1981, Ser. No. 266,864

Int. Cl.³ A01B *19/06*

U.S. Cl. 172—54.5 **1 Claim**



1. A machine movable in a given direction of travel for cultivating soil, comprising; a main beam extending substantially horizontally and transversely with respect to the direction of travel of a machine, a drive shaft mounted parallel to and spaced below the beam; a plurality of wobble bearings disposed spaced apart side-by-side on the drive shaft; a plurality of tool holders each supported on one of the wobble bearings and each comprising a lever guided for a rocking movement transversely of the direction of travel, at least one tine for each tool holder and means mounting the tines to the levers for sweeping a virtually continuous area extending over substantially the entire width of the main beam thereby coacting to form an impenetrable wall which exercises a downward deflecting action on stones or clods of earth at the surface of the soil to bring same into the range of the tines, the mounting means comprising a plurality of substantially U-shaped elements of spring metal each having its arch pointing in the direction of travel with the lower free limb connected to a tine and the upper free limb connected to a lever and configured at the arched portion to have a width which is about half the width of the swept area such that in their transverse rocking movement the forward portions of the elements in the direction of travel sweep a virtually continuous area extending over substantially the entire width of the main beam and wherein the lower free limb of each element has a rearward portion which tapers in width in a decreasing manner in a direction opposite to the direction of travel.

4,390,071

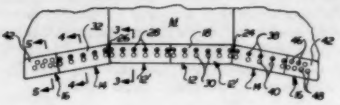
REPLACEABLE CUTTING BLADE ASSEMBLY FOR DOZERS

Richard E. Wright, Bucyrus, Ohio, assignor to Paper, Calmenson & Co., Saint Paul, Minn.

Filed Nov. 23, 1979, Ser. No. 96,892

Int. Cl.³ E02F *9/28*

U.S. Cl. 172—701.3 **15 Claims**



1. A replaceable cutting blade assembly for a U-dozer blade adapted for adjustable securement to a moldboard up to four times in four different configurations during the service life of said blade assembly to provide four positions of adjustment therefor, said assembly comprising a center section blade having a face with a longitudinal centerline thereacross and being bounded by first and second longitudinal working edges and opposing, mitered transverse edges having outwardly projecting miter tips, said center section blade further including at least one longitudinal row of bolt holes formed therein for securement thereof to said moldboard; wherein each of said miter tips is offset along said transverse edge intermediate said longitudinal centerline and one of said longitudinal working edges.

4,390,072

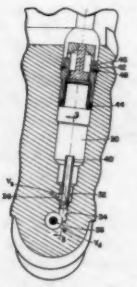
DRILL BIT LUBRICANT CIRCULATION SYSTEM

Charles M. Phelan, Fort Worth, Tex., assignor to Globe Oil Tools, Inc., Fort Worth, Tex.

Filed May 4, 1981, Ser. No. 259,860

Int. Cl.³ E21B *10/24*

U.S. Cl. 175—229 **8 Claims**



1. A lubricant circulating system of each rotary cone cutter of a rotary drilling bit comprising:

(a) a sealed bearing lubricating space defined between said rotary cone cutter and a journal shaft extending from the body of said bit with said cutter and said shaft co-acting during use of said bit to cause repeated changes in volume of said lubricating space;

(b) said body defining a lubricant reservoir in communication with said lubricating space through an inlet passageway and an outlet passageway;

(c) at least one of said passageways including connection with a substantially cylindrical chamber;

(d) the centerline of said one passageway being disposed substantially tangential with the cylindrical wall of said chamber to define a vortex flow passage providing flow

restriction from said passageway into said cylindrical chamber and less restrictive return flow; and

(e) said vortex flow passage co-acting with repeated volume variations in said lubricating space to cause lubricant flow circulation in the direction of least flow restriction.

4,390,073

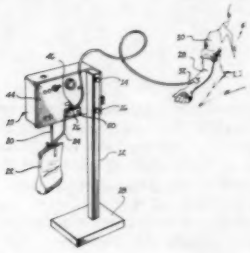
BLOOD COLLECTION BAG WEIGHING DEVICE

Evan W. Rosen, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Continuation of Ser. No. 81,164, Oct. 2, 1979, abandoned. This application Nov. 9, 1981, Ser. No. 319,573

Int. Cl.³ G01G *13/02*

U.S. Cl. 177—118 **8 Claims**



1. A blood collection bag weighing device for filling a blood collection bag with a predetermined weight of blood flowing from a tube extending from the vascular system of a donor, said device comprising in combination:

(a) means for clamping the tubing, said clamping means including a member for embodying stored potential energy when positioned in a retained state and for clamping the tube when positioned in a clamping state, said member including a planar surface and means for exerting a first magnitude of force against retention in the retained state and a second magnitude of force for clamping the tubing in the clamped state, which second magnitude of force is substantially greater than the first magnitude of force;

(b) a permanent magnet for overcoming the first magnitude of force to magnetically capture and retain said member in the retained state, said magnet including a straight edge and movable mounting means for accommodating realignment of said magnet to position said straight edge of said magnet in aligned contacting relationship with said planar surface of said member and maximize the magnetic coupling therebetween;

(c) means for momentarily disrupting the magnetic field of said magnet to a value insufficient to overcome the first magnitude of force and independent of the magnitude of the second magnitude of force and permit repositioning of said member from the retained state to the clamping state in response to said exerting means;

(d) means for sensing achievement of the predetermined weight by the blood collection bag during the filling of the blood collection bag; and

(e) means for generating an electrical signal in response to said sensing means to energize said disrupting means;

whereby, the energy level of said magnet and of said generated electrical signal may be unrelated to the level of energy of the second magnitude of force to clamp the tubing.

4,390,074

OPERATING KEY FOR ELECTRICAL SCALES

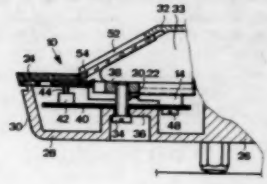
Karl Vogel, Greifensee, Switzerland, assignor to Mettler Instruments AG, Greifensee-Zarich, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,473

Claims priority, application Switzerland, Feb. 6, 1981, 801/81

Int. Cl.³ G01G *23/30, 23/14*

U.S. Cl. 177—177 **10 Claims**



1. A device for manual operation of an electrical scale having control circuit means responsive to a control signal, comprising

a first and second control switch arranged at a predetermined distance from each other and electrically connected to said control circuit so that activation of either of said switches furnishes said control signal to said control circuit;

an elongated activating member mounted relative to said first and second switch so that a force applied to said activating member at any point thereof operates at least one of said switches.

4,390,075

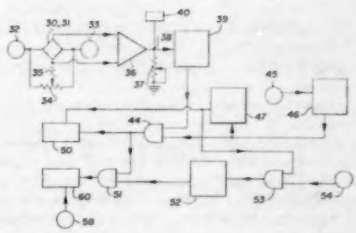
LOAD WEIGHING AND ACCUMULATING SYSTEM AND METHOD

Edwin deS. Snead, Box 798, Georgetown, Tex. 78626

Division of Ser. No. 945,075, Sep. 22, 1978, Pat. No. 4,230,196, which is a continuation of Ser. No. 841,383, Oct. 12, 1977, abandoned. This application Oct. 24, 1980, Ser. No. 200,327

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—210 FP **12 Claims**



1. A system for measuring and indicating the weight of a load including; a load supporting means; weighing means comprising transducer means operatively connected to said load supporting means for producing an instantaneous electric analog signal proportional to the supported weight; converter means coupled to the output of said transducer means for converting said analog signal to a frequency signal consisting of pulses generated at a frequency proportional to said analog signal; characterized by

a counter for counting and displaying output pulses from said converter;

gate means coupling said counter to said converter means, for controlling the passing of converter output pulses to said counter;

clock means coupled to said gate means for providing periodic

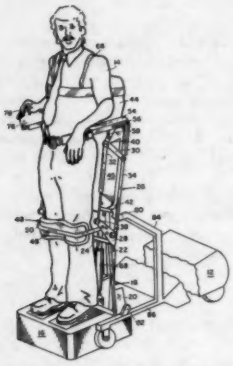
gate-open intervals of preselected uniform time, whereby the passed pulses are representative of the supported load;
and actuator means coupled to said gate means for initiating a single gate-open interval, whereby said counter functions as an accumulator counter for successive supported loads responsive to successive operations of said actuator means.

4,390,076

INTEGRATED WHEELCHAIR AND AMBULATOR

John P. Wier, and Robert A. Garrett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 62,835, Aug. 1, 1979. This application Jan. 26, 1981, Ser. No. 228,503
Int. Cl.³ B62D *51/00*
U.S. Cl. 180—11 **4 Claims**



1. An integrated separable ambulator and wheelchair comprising:
the ambulator including:
a base which is capable of resting on a floor and supporting a person's feet;
a seat;
a framework of articulated linkage mounted on the base for supporting the seat between horizontal and vertical positions;
means for selectively moving the seat between the horizontal and vertical positions so that a person can be supported between sitting and standing positions respectively;
said ambulator and wheelchair having mating connecting means when the seat is in a vertical position; and
means for lifting the base clear of the floor when the ambulator and wheelchair are mated so as to enable the wheelchair to be maneuvered with the ambulator supported thereon.

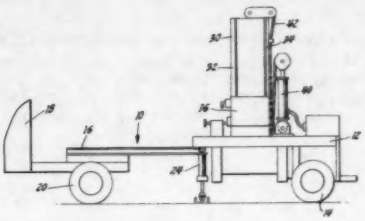
4,390,077

APPARATUS HAVING PUSH/PULL ACTUATED BOOM FOR GENERATING WAVES IN THE GROUND

Earl Fulkerson, 4111 9th St. East, Bradenton, Fla. 33508

Continuation-in-part of Ser. No. 112,394, Jan. 15, 1980, Pat. No. 4,291,780, and Ser. No. 11,875, Feb. 13, 1979, Pat. No. 4,244,437. This application Oct. 20, 1980, Ser. No. 198,530
Int. Cl.³ G01V *1/147*
U.S. Cl. 181—121 **4 Claims**

1. Apparatus for generating waves in the ground comprising:
a frame;
an elongated, linear, rigid boom movably mounted on the frame in a first boom position;
a hammer mounted on the boom for movement therealong;
means mounted on the boom and connected to the hammer for raising it to a first elevated position, and for dropping it from said first elevated position;
an anvil having a first impact surface and a second impact surface, the anvil being mounted on the ground beneath the frame in a position such that the first impact surface is aligned with the path of motion of the hammer as it is being dropped from said first elevated position, the second impact surface being spaced from the first impact surface;



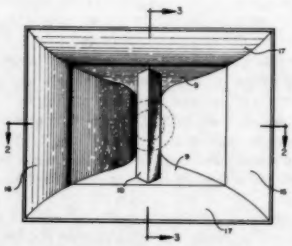
positioning means mounted on the frame and connected to the boom for pivoting it from said first boom position to a second boom position to guide the hammer for a downward motion from a second elevated position toward the anvil to strike the second impact surface, the second elevated position of the hammer being horizontally spaced from said first elevated position;
whereby the hammer is operative to generate a wave in the ground by a downward motion from either said first elevated position or said second elevated position without repositioning either the frame or the anvil with respect to the ground.

4,390,078

LOUDSPEAKER HORN

Bruce Howze, Springfield, and Clifford Henrickson, Wallingford, both of Pa., assignors to Community Light & Sound, Inc., Philadelphia, Pa.

Filed Feb. 23, 1982, Ser. No. 351,439
Int. Cl.³ G10K *11/00*
U.S. Cl. 181—185 **10 Claims**



1. A loudspeaker horn for use with an electro-acoustical driver, the horn comprising:
a throat section joined to the driver and having an entrance aperture matched to the driver, the throat section then blending to a rectangular cross-section having top and bottom walls which are substantially planar and diverge at a first angle and having side walls which are curved to maintain an exponential expansion rate of cross-section;
a transition section joined to the throat section and having substantially planar top and bottom walls that diverge at a second angle and having curving side walls;

a central vane having a leading portion extending from the top wall of the transition section to the bottom wall thereof, forming two air channels which expand in cross-section at an exponential rate and diverge from one another at a third angle, the air channels having a rectangular cross-section, the horizontal dimension thereof being substantially smaller than the vertical dimension; and,

a wave-guide section joined to the air channels of the transition section, having planar top and bottom walls that diverge at the second angle and having said walls that are planar, blend smoothly with the side walls of the transition section and diverge outwardly at a fourth angle such that the conical expansion of the wave-guide section is nowhere more rapid than the exponential expansion rate of the transition section, a continuation and termination portion of the vertical vane being disposed in the transition section, rejoining the two air channels into one air channel of rectangular cross-section, whereby the loudspeaker horn projects acoustical energy over a substantially constant coverage angle and over a wide frequency range, properly loading the driver at all operating frequencies.

4,390,079

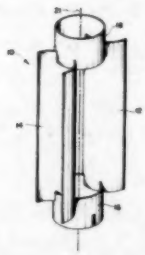
MUFFLER AND EXHAUST EXTRACTOR

Robert Brill, 815 Nile St., Golden, Colo. 80401

Continuation-in-part of Ser. No. 73,532, Sep. 7, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 209,192

Int. Cl.³ F01N *7/08, 1/14*

U.S. Cl. 181—227 **4 Claims**



1. An exhaust pipe attachment for internal combustion powered vehicles comprising:

first and second curved airfoils mounted parallel to and spaced from one another and to a longitudinal axis generally perpendicular to the direction of movement of the vehicle to form an open ended converging diverging passageway for accelerating airflow therethrough to produce a low pressure area;

means for mounting the first and second airfoils in the airstream produced by moving the vehicle generally perpendicular to the direction of flow of the airstream with the open ended converging diverging passageway adjacent to and in communication with an exhaust outlet of the vehicle such that the exhaust gases flow into the low pressure area and such that turbulent air is produced on either side of the airfoils for dissipating the sound waves formed by the exhausting gases.

4,390,080

PORTABLE LIFT WITH LADDER

Sherman W. Bushnell, Jr., 1214 E. Hamlin St., Seattle, Wash. 98102

Filed Jan. 26, 1981, Ser. No. 228,679

Int. Cl.³ E06C *5/20*

U.S. Cl. 182—115 **12 Claims**

1. A lift comprising:

a base,

a multistage extensible mast mounted on the base, said mast having a top stage, and intermediate stage, and a bottom stage,

a platform on the mast,

a multi-sectioned extensible ladder to give access to said platform, said ladder having a top sloped section fixed to said top stage, an intermediate sloped section having a sliding fit at the upper end with said top section, and a bottom sloped section having a sliding fit at its upper end with said intermediate section, said bottom section being pivotally connected at its lower end to said base, and said intermediate section being pivotally mounted at its lower end to a brace connected to said intermediate stage of the mast,

means for extending said mast, and

means for extending said ladder responsive to extension of said mast.

4,390,081

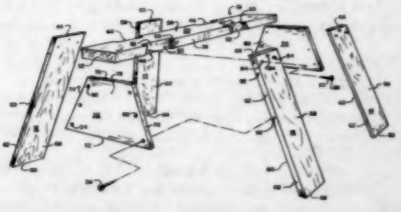
SAWHORSE AND SAWHORSE KIT AND METHOD OF PACKAGING THEREOF

James H. Olmsted, Boulder, Colo., assignor to McCoy Industries, Inc., Denver, Colo.

Filed Dec. 1, 1980, Ser. No. 211,625

Int. Cl.³ B27B *21/00;* **F16M** *11/00;* **B65B** *3/04*

U.S. Cl. 182—151 **5 Claims**



1. A sawhorse kit, comprising;

four leg members, each having a rectangular cross-sectional configuration and being defined by relatively broad width, parallel outside and inside side surfaces, relatively

narrow-width, parallel edge surfaces, and parallel top and bottom surfaces;

an elongated top piece having a rectangular cross-sectional configuration defined by relatively broad width top and bottom surfaces adapted to be oriented generally parallel to a generally planar support surface for the sawhorse, relatively narrow height, elongated side surfaces, and relatively narrow height end surfaces, the top piece having two channels defined in each side surface, each channel being defined by two opposed side abutment surfaces and by an interconnecting abutment surface, each channel being adapted to receive and seat a top end portion of one of the leg members so that the side and interconnecting abutment surfaces of the channel are in abutting engagement with a portion of the two edge surfaces and one of the side surfaces, respectively, of one of the leg members with the leg member extending downwardly and outwardly from a vertical plane including the longitudinal axis of the top piece and downwardly and outwardly from a vertical plane transverse to the longitudinal axis of the top piece and bisecting the top piece, the channels being spaced from the ends of the top piece a sufficient distance to provide a work space on portions of the top surface of the top piece extending longitudinally outward from the channels to the end surfaces of the top piece, the top piece having a longitudinal length about the same as, or longer than, the combined longitudinal length of one edge surface of a leg member plus the longitudinal length of a bottom surface of a brace member;

at least two brace members adapted to be placed in abutting engagement with the bottom surface of the top piece with each brace member extending between the outside side surfaces of opposing leg members on opposite sides of the top piece, the brace members having a perpendicular height from the bottom surfaces to the top surfaces thereof about the same height as, or slightly higher than, the width of the side surfaces of the leg members and the width of the top and bottom surfaces of the top piece;

fastener means adapted to securely fasten the brace members to the leg members and the leg members to the top piece;

the top and bottom surfaces of the leg members being inclined such that when when each leg member is received and seated in a channel, the top surface of each leg member is parallel to and falls in a plane including the top surface of the top piece while the bottom surfaces of the leg members are substantially coplanar so as to provide stable support for the sawhorse on a generally planar sawhorse support surface; and

package means for containing the leg members, top piece, brace members, and fastener means in unassembled form, the package means having a length slightly longer than the longitudinal length of the top piece, a width slightly wider than the perpendicular height of one of the brace members, and a heigth slightly higher than the combined stack height of the leg members, the top piece and the brace members when the leg members, top piece and brace members are vertically stacked in five separate layers in a generally hexhedronal peripheral configuration with two layers each comprising one leg member and one brace member arranged in end to end relationship, two layers each comprising one leg member and one layer comprising the top piece, the package means being adapted to receive and enclose the sawhorse kit.

4,390,082

RESERVE LUBRICANT SUPPLY SYSTEM

Judson S. Swearingen, Malibu, Calif., assignor to Rotoflow Corporation, Los Angeles, Calif.

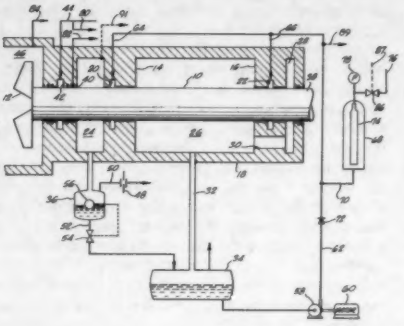
Filed Dec. 18, 1980, Ser. No. 217,572

Int. Cl.³ F02C *7/06*; F01M *1/16*

U.S. Cl. 184—6.4 **14 Claims**

10. In a rotary mounting system for an impeller and having a lubricated bearing and a pressurized main lubricant supply system, a reserve lubricant supply system comprising

a reserve lubricant reservoir, a passage between said reserve lubricant reservoir and the pressurized supply of the main



lubricant supply system, a gas pressurized chamber having an expansible wall common to said reservoir and a gas pressure source line in communication with said gas pressurized chamber, said source line receiving pressure from the adjacent impeller.

4,390,083

DOUBLE-CONDUIT CENTRAL LUBRICATING SYSTEM

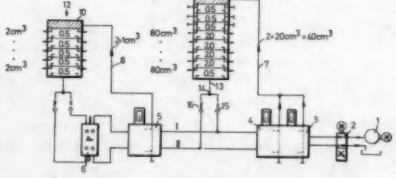
Horst Saretzky, Ennepetal, Fed. Rep. of Germany, assignor to De Limon Fluhme GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,758

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014502

Int. Cl.³ F16N *25/02*

U.S. Cl. 184—7 F **5 Claims**

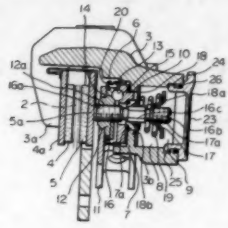


1. A double-conduit central lubricating system having two feed conduits supplied by a pump via a switch device which operates as a function of pressure difference and via a control valve, at least one double-conduit lubricant distributor being connected to said feed conduits, characterized by the fact that a control chamber (**9, 10**) of a progressive distributor (**11, 12**) is connected to an outlet of the double-conduit lubricant distributor (**3, 4, 5**) via a control conduit (**7, 8**) the pressure inlet, constituting a pressure connection, of said progressive distributor in the initial segment being connected with both feed conduits (I, II), the control chamber (**9, 10**) of the progressive distributor (**11, 12**) having no direct connection to the pressure connection of the initial segment.

4,390,084
MECHANICAL DISC BRAKE

Tetsuo Haraikawa, Funabashi, and Koichi Tamura, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Feb. 9, 1981, Ser. No. 233,077
Claims priority, application Japan, Feb. 18, 1980, 55-18805
Int. Cl.³ F16D 65/38
U.S. Cl. 188—71.7 5 Claims



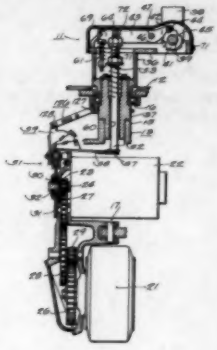
1. A disc brake comprising:
a disc, having opposite first and second sides, rotatable about an axis of rotation;
first and second friction pads respectively disposed on said first and second sides of said disc;
a stationary member;
a caliper supported on said stationary member to slide in a direction parallel said axis of rotation, said caliper straddling the circumference of said disc to define first and second limb portions respectively on said first and second sides of said disc, said first limb portion engaging said first friction pad for pressing said second friction pad against said first side of said disc, said second limb portion having an opening therein extending in an axial direction parallel said axis of rotation,
a threaded rod, threaded with a first pitch, and extending along a line in said axial direction through said opening, one end of said rod abutting said second friction pad;
force converting means, engaging said second limb portion and threadingly engaging said threaded rod and including means for rotating said rod about said line, for pressing said one end of said rod against said second friction pad to press said second friction pad against said second side of said disc;
a spring retainer having a seating surface, threadingly engaging said rod so as to be screwably movable along said rod relative to said force converting means;
a coil spring comprising a coil extending in said axial direction, disposed between said spring retainer and said second limb portion so as to bias said rod in said axial direction away from said second friction pad; and
a projection provided on said seating surface of said spring retainer for engaging the end of the coil adjacent thereto in the circumferential direction of said coil, to control the rotation of said spring retainer around said rod so as to bias said spring retainer against rotation in a loosening direction.

4,390,085
AUTOMATIC MECHANICAL BRAKE ADJUSTER

Terry R. Downing; John M. Zorns, both of Glenwood, and Winfred C. Croft, Park Forest South, all of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 24, 1981, Ser. No. 295,321
Int. Cl.³ F16D 55/08, 65/52
U.S. Cl. 188—72.9 2 Claims

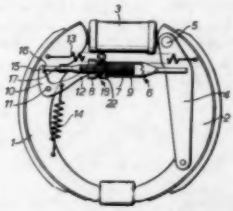
1. In a vehicle having a wheel rotatably mounted on a support which, in turn, is rotatably mounted on a frame portion of said vehicle for steering movement about a generally vertical axis and including a rotatable brake disk which rotates whenever the wheel rotates, a braking mechanism characterized by
a brake shoe in confronting relation to an axial face of said disk,
an operator-controlled brake operating linkage operable to transmit brake engaging force when moved in one direction,
spring means biasing said linkage in said one direction,
a lever mounted on said support for pivotal movement between a brake engaged position and a brake disengaged position, said lever including relatively rotatable parts and a ratchet mechanism therebetween one of said relatively rotatable parts being in operating relationship with said shoe, and
back-off distance limiting means including an adjustable link extensible upon being subjected to predetermined elongating force, opposite ends of said link being secured to said support and said one part by pivot connections, one of said pivot connections being a lost-motion connection which determines the back-off distance for said brake shoe.



4,390,086
AUTOMATIC ADJUSTERS FOR DRUM BRAKES

Willibrod Conrad, Octendunig, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed May 19, 1980, Ser. No. 151,298
Claims priority, application United Kingdom, May 21, 1979, 7917628
Int. Cl.³ F16D 65/40
U.S. Cl. 188—79.5 B 6 Claims



1. An automatically adjustable internal shoe drum brake having a brake drum, at least one brake shoe, a hydraulic actuator for moving the at least one brake shoe outwardly into engagement with the brake drum, a mechanical actuator operable independently of the hydraulic actuator to move the at least one brake shoe outwardly into engagement with the brake drum, spring means biasing the at least one brake shoe inwardly away from the brake drum, a strut for limiting inward

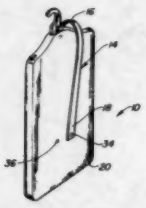
movement of the at least one brake shoe under the influence of the spring means, the strut comprising first and second telescopically arranged parts having opposing abutment surfaces, a bimetallic element having an aperture through which at least one of said parts of the strut passes and having first and second abutment surfaces which engage the first and second abutment surfaces of the strut respectively, the bimetallic element being effective upon being subjected to an elevated temperature to move the abutment surfaces of the strut away from each other to increase the length of the strut, and an adjuster automatically operable as the at least one brake shoe wears to increase the effective length of the strut.

4,390,087

GARMENT CARRYING DEVICE

Paul Goldfinger, 4243 Howe St., Oakland, Calif. 94611

Filed Sep. 8, 1981, Ser. No. 299,725
Int. Cl.³ A45C *13/00, 13/26*
U.S. Cl. 190—41 B **5 Claims**



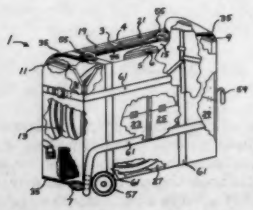
1. A hanging garment carrying device comprising:
a. a frame member defined to extend along the direction in which the garment hangs, said frame member having an upper portion and a lower portion;
b. a strap having a first end portion and a second end portion;
c. an enclosure for covering at least a portion of the garment and said frame;
d. means for holding said first end portion of said strap to said upper portion of said frame member;
e. means for holding said second end portion of said strap to said lower portion of said frame member;
f. a hook connected to said frame member and extending outwardly from said enclosure; and
g. an arm connected to said frame and connected hook, said arm being capable of extending there from within said enclosure.

4,390,088

CONTAINER BAG SYSTEM FOR BICYCLES

Richard K. Brenner, 2338 18th Ave., Forest Grove, Oreg. 97116

Continuation-in-part of Ser. No. 17,370, Mar. 5, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,233
Int. Cl.³ A45C *13/02*
U.S. Cl. 190—51 **18 Claims**



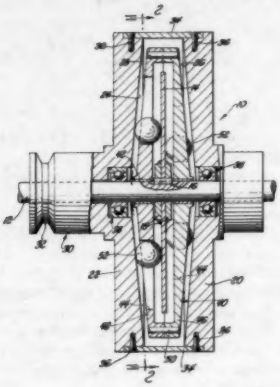
1. A bicycle transporting container system comprising:
a first bicycle bag defining an inner pocket;
a second bicycle transporting container bag insertable in the inner pocket of the first bag;
means for reinforcing the sides of the second bicycle transporting container bag,
said reinforcing means comprising a rigid panel,
said rigid panel being hinged to permit folding;
and a detachable luggage style container operatively connected to the first bag.

4,390,089

TORQUE CONVERTER

Peirce E. Dalrymple, 1671 Bedford Sq., Rochester, Mich. 48063

Filed Mar. 5, 1981, Ser. No. 240,907
Int. Cl.³ F16D *43/14*
U.S. Cl. 192—105 B **13 Claims**



1. A torque converter assembly (10) comprising: distortable input means (14) rotatable about an axis, output means (20, 22) freely rotatably about said axis relative to said input means (14) in a deactuated condition and variably rotatable relative to said input means (14) between said deactuated condition and a fully actuated condition at which said output means (20, 22) rotates at the same speed as said input means (14) and characterized by at least one roller means (52) disposed between said input means (14) and said output means (20, 22) and radially movable under the influence of centrifugal force for variably distorting a portion of said input means (14) in a wave-like fashion between said deactuated and fully actuated conditions to rotate said output means (20, 22) at a speed relative to said input means (14) in proportion to the amount of distortion of said input means (14).

4,390,090

METHOD AND APPARATUS FOR DUST FREE GRAIN LOADING

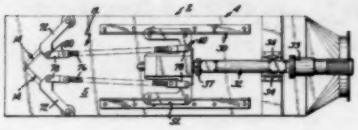
Friedrich K. O. Kossebau, Braunschweig, Fed. Rep. of Germany, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 17,927, Mar. 6, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,895
Int. Cl.³ B65G *11/20*
U.S. Cl. 193—32 **3 Claims**

1. An improved apparatus for the dust free loading of bulk materials of the type which includes a housing adapted to be attached to the output end of a discharge chute through which a stream of bulk material flows by gravity in a downward path, and which also includes a shutoff means located adjacent to a material outlet opening of the housing for imparting an adjustable force on the bulk material stream, and wherein the improvement comprises:

retarding means carried with the housing and located in the path of the bulk material stream above the shutoff means for absorbing a portion of the kinetic energy thereof, whereby release of dust is substantially suppressed during discharge of the bulk material stream from the housing, and wherein the retarding means comprises:

(a) a hollow inverted cone mounted inside the housing for contacting and slowing the bulk material stream to form a vertical column of the bulk material, the cone having an



outlet opening for allowing a limited amount of the bulk material stream to flow therethrough; and

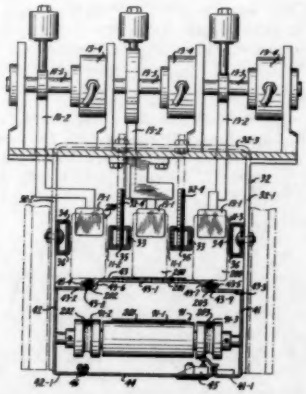
(b) a hollow, perforated tube attached to the cone and extending upwardly therefrom for confining the bulk material column, wherein the tube is smaller than the housing to define a discharge chamber for the bulk material column, whereby the remaining amount of the bulk material stream contained in the bulk material column is discharged through the perforations in the tube into the chamber.

4,390,091

MODULAR CONVEYOR GUIDE AND SYSTEM UTILIZING SAME

Hector M. Gonzalez, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,280
Int. Cl.³ B65G 37/00
U.S. Cl. 198—358 **43 Claims**



1. Apparatus comprising a modular conveyor guide including:

first and second spaced end walls;

a third wall connecting said first and second end walls, said third wall having a first region for guiding a first conveyor and second and third regions on opposite sides of said first region for guiding second and third conveyors;

said first region being adapted to guide a flat conveyor;

said second and third regions being adapted to guide cable conveyors;

said second region including first and second upstanding flanges spaced to receive a cable conveyor;

said third region including third and fourth upstanding flanges spaced to receive a cable conveyor;

said first, second and third walls and said first, second, third and fourth flanges forming an integral track segment formed by extrusion;

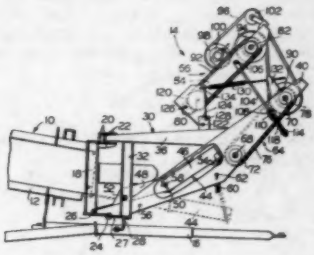
said first region having an upper flat surface for receiving said flat conveyor, said upper flat surface defining the uppermost extent of said extruded track segment between said first and second flanges and said third and fourth flanges.

4,390,092

ANTI-SLIP BALE THROWER

Harold K. Garrison, Newton, and Howard J. Ratzlaff, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jun. 14, 1979, Ser. No. 48,342
Int. Cl.³ B65G 31/02
U.S. Cl. 198—638 **8 Claims**



1. A bale thrower adapted for attachment to the discharge end of a baler for receiving bales successively issuing therefrom and for throwing the same in succession into a remote receptacle or the like, said thrower comprising:

a pair of opposed conveyors located on opposite sides of the normal path of travel of bales through the thrower and defining a bale entrance and a bale exit of the thrower,

said conveyors being provided with respective bale-engaging surfaces driven in directions corresponding to the direction of bale travel from said entrance to said exit; and

means mounting said conveyors for relative shifting thereof toward one another in an area that includes said entrance in response to entry of a bale into the entrance and engagement of the bale with said surfaces whereby to clamp the conveyors about the entering bale as said surfaces cooperate to propel the bale along said path of travel.

4,390,093

APPARATUS FOR CONVEYING SHEETS SUCH AS VENEER HAVING IMPROVED WICKET CONSTRUCTION

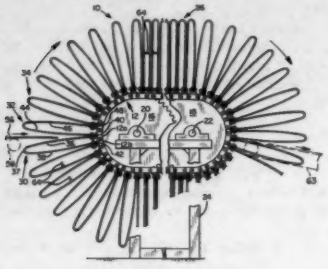
James W. Chard, Jr., and Timothy F. Corrigan, both of Vancouver, Wash., assignors to Drying Systems, Inc., Vancouver, Wash.

Filed Mar. 30, 1981, Ser. No. 248,977
Int. Cl.³ B65G 47/86
U.S. Cl. 198—654 **10 Claims**

1. In sheet conveying apparatus including a conveyor operable for movement through an arcuate run and a substantially rectilinear run, the improvement comprising:

elongate arm means carried by the conveyor and extending outwardly therefrom for transferring conveyor movement to a sheet, said arm means including first and second, spaced-apart elongate members which flex outwardly relative to one another during movement of said arm means through the arcuate run, said elongate members being interconnected adjacent their outer ends, and

means for mounting said elongate members including first and second mounting means provided on the conveyor which angulate one relative to the other during the arcu-



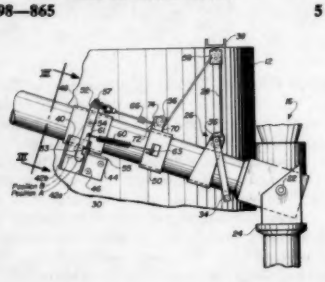
ate run and which align in the direction of conveyance during the rectilinear run, said first and second elongate members being mounted on and extending outwardly from said first and second mounting means, respectively.

4,390,094

AUTOMATIC LATCH FOR UNLOADING AUGER

Ernest A. Schoeneberger, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 18, 1981, Ser. No. 235,394
Int. Cl.³ B65G *21/10*
U.S. Cl. 198—865 **5 Claims**



1. In combination with a container having a movable unloading auger, the improvement comprising:

means for supporting said auger, said means being a support member connected to said container and extending therefrom;

a latch arm movably mounted on said auger, said latch arm having a notch formed therein;

a latch arm receiver connected to said container, said receiver being a protruding member connected to said support member for engagement with said latch arm notch;

means connected for raising and lowering said auger, said means including a cable operably connected to move said latch arm between a first position, where said notch is in engagement with said receiver protruding member, and a second position, where said notch is out of engagement with said receiver protruding member;

resilient means for urging said latch arm from said second position to said first position;

means for limiting movement of said latch arm to said second position;

said latch arm being moved from said first position to said second position when the tension in said cable overcomes the force of said resilient means; and

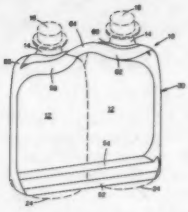
said latch arm being moved from said second position to said first position when the force of said resilient means overcomes the tension in said cable.

4,390,095

LAY FLAT TUBE MULTI-PACKAGING DEVICE FOR CONTAINERS

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 207,269, Nov. 17, 1980, abandoned. This application Feb. 23, 1981, Ser. No. 236,779
Int. Cl.³ B65D *71/02, 63/10, 85/62*
U.S. Cl. 206—150 **14 Claims**



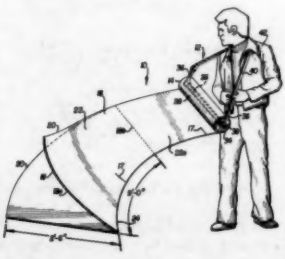
1. A one-piece generally scrapless multi-packaging device for a plurality of containers or the like each having upper ends, bottom ends and sidewalls, said multi-packaging device including a flattened band of stretchable and elastic material which is of smaller predetermined measurement than the vertical circumferential dimension of a plurality of such containers, such flattened band having an integrally continuous wall with upper and lower band segments, the upper band segment having spaced openings therein for receiving the upper end of said containers and the lower band segment being provided for engaging the bottom ends of said containers, said flattened band being stretched from its smaller predetermined measurement into elastic gripping engagement with the upper and and bottom ends and sidewalls of said containers along the vertical circumferential dimension thereof to form a container package for gripping and transporting the containers.

4,390,096

DISPOSABLE RAIN PONCHO SYSTEM

Frank G. Goldenberg, 3700 Sherwood Pl., Lynchburg, Va. 24503

Filed Apr. 14, 1981, Ser. No. 254,023
Int. Cl.³ B65D *85/66, 85/67, 85/18*
U.S. Cl. 206—390 **7 Claims**



1. A system for dispensing disposable rain garments comprising:

a plurality of rain garments, each of said rain garments being constructed of flexible, water-resistant, material having two end edges and side edges;

said rain garments being frangibly attached at the end edges

thereof to end edges of adjacent rain garments, to form a string of attached rain garments having first and second extreme ends from which individual rain garments can be ripped, said rain garment string being wrapped into a roll with said first extreme end being exterior of said roll and said second end being inside said roll; and

a dispenser means for mounting said rain-garment-string roll to allow access to the first-extreme-end rain garment and to allow said roll to be turned to thereby rotate the first-extreme end rain garment from said roll, so that said first-extreme-end rain garment can be ripped from said string along its frangible attachment to an adjacent rain garment, said dispenser means including a shoulder strap for allowing an individual to carry it around while walking and for allowing relatively-free unrolling of rain garments therefrom while being thusly carried by said shoulder strap.

4,390,097

PACKAGED ELECTRIC LAMP

Franciscus M. Klomp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,665

Claims priority, application Netherlands, Jul. 14, 1980, 8004029

Int. Cl.³ B65D *85/42*

U.S. Cl. 206—418 **9 Claims**

1. An electric lamp package, which comprises a lamp envelope connected at one end to a lamp cap; an elongate packaging strip folded along parallel transversal first fold lines to form a bottom wall, a front wall and a rear wall for accommodating the lamp with its lamp cap remote from the bottom wall, the front wall and the rear wall extending above the lamp cap and engaging each other; a lengthwise extending opening formed in the front wall to provide a window for displaying at least part of the lamp cap and a part of the lamp envelope, the boundary of said opening engaging the lamp to hold the same in place; a pair of lengthwise incisions formed in the rear wall and extending beyond the lamp cap to provide two edge portions in opposite lateral edge-wise contact with the lamp envelope; and means to secure the respective edge portions to the front wall.

4,390,098

AUTOMATIC CLOSURE REJECT FROM UPSTACKING DEVICE

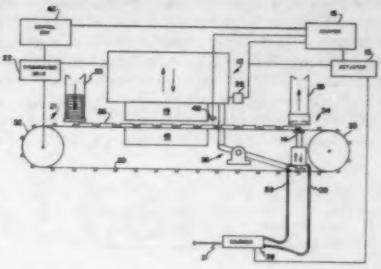
William D. Wilgus, and Earl L. Backes, both of Findlay, Ohio, assignors to Ball Corporation, Muncie, Ind.

Filed Nov. 6, 1980, Ser. No. 204,416

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—571 **27 Claims**

1. An upstacker with reject means comprising: means to index articles through an upstacking station; a receiving means positioned above said upstacking station and having means to retain articles placed therein from said upstacking station; a variable length member capable of reciprocating motion positioned such that in the extended mode, reciprocation of said member will bring the upper end thereof into said upstacking station and push said articles upward into said receiving station, while in the contracted mode, said member will reciprocate without contacting articles indexed into said upstacking station whereby said articles will be rejected by said means to



index articles through said upstacking station; and actuating means to determine the mode of said variable length member.

4,390,099

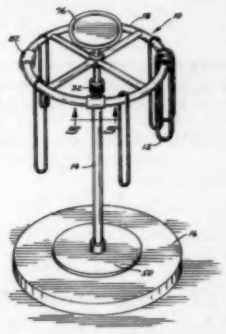
DISPLAY STAND FOR JEWELRY ARTICLES

Fred S. Trautlein, Fords, N.J., and James R. Stephens, New York, N.Y., assignors to General Mills Products Corp., Minneapolis, Minn.

Filed Nov. 3, 1980, Ser. No. 203,167

Int. Cl.³ A47F *7/02*

U.S. Cl. 211—4 **13 Claims**



1. A display member comprising a loop member, a hub, spoke means for attaching said loop member to said hub, said loop member having a substantially circular cross-sectional configuration, said loop member being formed with a plurality of gaps which separate the loop into a plurality of segments, a plurality of sleeve means movably mounted on said loop segments, said sleeve means having substantially the same arc as the loop member, each sleeve means being movable along the periphery of said loop member whereby it surrounds a gap, each said sleeve means being effectively locked with respect to said loop member by rotating it relative to said loop member, and means for mounting said display member with respect to a support structure.

4,390,100

MAIL SORTER WITH AN EXPANDABLE BELLOWS BINDING

Darlene M. Petron, 16612 Park La., Wayzata, Minn. 55391

Filed Jan. 30, 1981, Ser. No. 230,403

Int. Cl.³ B42F *21/00*

U.S. Cl. 211—10 **4 Claims**

1. A device for sorting sheet material such as mail, corre-

spondence, documents or the like comprising: a plurality of superposed leaves having identical length and width dimensions, said leaves defining sorting or classifying spaces between adjacent ones of said leaves; and a flexible, bellows binding secured to a selected edge of each of said leaves, said bellows binding providing the only means of permanent attachment between adjacent leaves, said selected edge being identical for all of said leaves to thus form a flexible bellows bound sorting book of superposed leaves, which may be spread open, as by grasping the uppermost and lowermost leaves of said book, so that said leaves are disposed in staggered, stair-step, offset

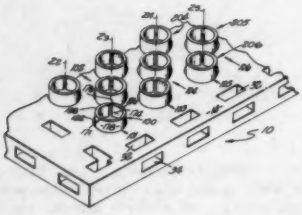
fashion to ease insertion of the material being sorted between adjacent leaves and, upon completion of a sorting operation, said leaves may be gathered together into superposed relationship to facilitate simultaneous or serial removal of the sorted documents from between the leaves of said book, said device being reversible so that either the upper or lower faces of all of said leaves will be visible when said book is spread open with said leaves disposed in stair-step, offset fashion, each of said leaves having at least one set of identifying indicia on each face of each of said leaves, said indicia on either the upper or lower faces of all of said leaves being visually perceivable when said book is spread open.

4,390,101

ARTICLE MOUNTING RACK

John A. Humphreys, 1125 Hugo Reid, Arcadia, Calif. 91006, and Michael D. P. Humphreys, 6008 N. Camellia Ave., Temple City, Calif. 91780

Filed Dec. 24, 1980, Ser. No. 219,800
Int. Cl.³ A47G *19/08*
U.S. Cl. 211—41 **13 Claims**



1. A panel for an article mounting rack comprising:

a planar member having a top surface;

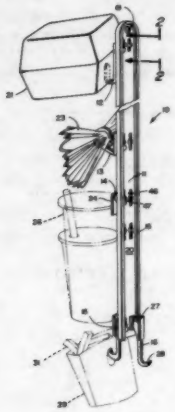
a plurality of clamping pillars arranged in a matrix configuration along the top surface to define a plurality of parallel first rows of pillars and a plurality of parallel second rows of pillars, the second rows being perpendicular relative to the first rows of pillars whereby the article is selectively wedged and held between at least two of the clamping pillars in adjacent parallel ones of the first and second rows, each clamping pillar comprising an upstanding member having a support portion interconnected to the top surface and a laterally resiliently deformable portion attached to the support portion in spaced relationship to the top surface whereby the deformable portion is laterally deformed when the article is selectively wedged and held between at least two of the clamping pillars in adjacent parallel ones of the first and second rows.

4,390,102

SUPPORT UNIT FOR PACKAGED CONVENIENCE FOODS

Gerald H. Lane, 100 Cerreda Cello, Suisun City, Calif. 94585

Filed Jun. 19, 1980, Ser. No. 160,954
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—71 **3 Claims**



1. A suspendable mobile support for packages or containers of convenience food items such as hamburgers, french fried potatoes, beverages and the like, comprising:

an elongated standard with means for suspending same in pendulum fashion at its upper end from a support, for example a motor vehicle interior;

said standard including a central, longitudinally extending, generally planar web portion having at least two laterally spaced rows of longitudinal slot like openings extending therethrough along its length, said openings including enlarged portions;

a set of holding members for holding said packages, each holding member including a reentrant portion for engaging said packages, and a base portion arranged to be mechanically quickly interlocked with the standard without a separate fastener means;

each base portion of said holding members including a flat body portion from which protrudes an elongate rib and an enlarged head, said rib and head arranged to mechanically interlock in quick fashion with one of said slot-like openings in said web of the standard with said head extending through the opening for retaining said holding member at a single position against the web in stable fashion;

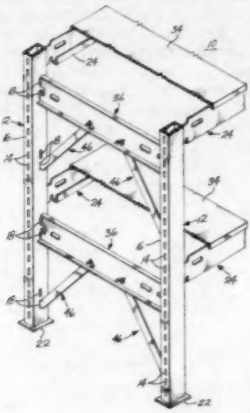
said set of holding members including at least one holding member including means for impaling and supporting the bottom edge of a hamburger package or container; at least one holding member for engaging and retaining the upper portion of a beverage container; and at least one holding member including retaining lip means for engaging and supporting the bottom portion of a beverage container adjacent the standard, said last-mentioned holding member having a depending, hook-like member disposed below said retaining lip means, said hook-like member arranged to engage and support another food package beneath a beverage container supported by said last-mentioned holding member.

4,390,103

SHELVING SYSTEM

Wallace T. Husband, West Vancouver, Canada, assignor to E-Z-Rect Metal Products Ltd., North Vancouver, Canada

Filed Jan. 23, 1981, Ser. No. 228,173
Int. Cl.³ A47F 5/14
U.S. Cl. 211—182 5 Claims



1. In a frame construction including an upright, first frame member having a face wall and a second frame member having one end portion connected to the first frame member to extend transversely from the face wall, the improvement comprising:

a. a first slot formed in the first frame member face wall at a location spaced from the intersection of the first frame member with the second frame member;

b. a second slot formed in the second frame member at a location spaced from the end portion of the second frame member;

c. a diagonal brace having:

a first end portion extendable through the first slot to engage with the first frame member face wall,

an elongate intermediate portion, and

a second end portion extending transversely to the length of the brace intermediate portion, said second end portion extendable through the second slot; and including a base section and an elongate, relatively narrow locking tab section formed integrally with and nominally disposed coplanar with the base section; and

d. said locking tab section;

extending transversely outwardly from the base section in a direction generally along the length of the second frame member;

including a generally straight edge portion spaced away from the adjacent side face of the brace intermediate portion to form a clearance gap therebetween to receive portions of the second frame member; and

being bendable relative to the second end portion base section to a location skewed from the plane of the base section to dispose the tab section edge portion over the adjacent face of the second frame member to securely lock the second frame member between the locking tab edge portion and the brace intermediate portion.

4,390,104

FLEXIBLE PLASTIC STERILE CLOSURE SYSTEM FOR CONTAINERS

Robert Cummings, Richardson, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.

Filed Aug. 19, 1981, Ser. No. 294,331
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.
Int. Cl.³ B65D 41/32, 51/20
U.S. Cl. 215—232 5 Claims

3. A flexible plastic multilayered cover for resealing an intravenous solution container, comprising:

a first layer of flexible plastic material forming an upper surface of the cover, said first layer being formed from a material substantially impermeable to moisture and bacteria;

a second layer of flexible plastic material bonded to said first layer of plastic material, said second layer having an orientated plastic film with a tensile strength in the direction normal to the direction the cover is pulled in removing it from a container greater than the tensile strength parallel to the direction of removal;

an area of adhesive material bonded to the surface of said second layer for adhering to the top of an IV solution container;

an adhesive free region of said second layer for aligning with the port of the container sealed by the cover, whereby the sterility of the covered portion of the IV solution container is retained by placing the sealing cover on the portion of the container top to be sealed; and

a plurality of generally T-shaped slits formed in said sealing cover to promote the separation of the cover upon its removal for forming telltale strips of material indicating the sterile seal has been broken.

4,390,105

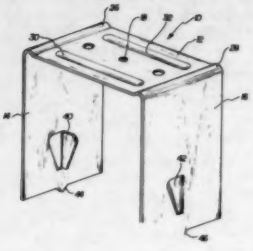
ELECTRICAL OUTLET BOX

Howard K. Graves, Berlin, Ohio, assignor to Valen Mfg. Co., Cleveland, Ohio

Filed Jul. 31, 1981, Ser. No. 289,059
Int. Cl.³ H02G 3/08
U.S. Cl. 220—3.6 6 Claims

1. An electric outlet box for mounting in a wall opening and having first mounting means adapted to abut against a front face of a support wall through an opening of which the box is adapted to extend, second mounting means adjustably secured to the exterior of said box, said second mounting means including an essentially U-shaped member having a base portion and first and second leg portions extending therefrom in the direction of the box opening, connecting means for adjustably connecting said box with said base member for varying the distance therebetween, said first and second leg members having first and second camming means extending therefrom toward the exterior side walls of said box, said box having slots for receiving said first and second camming members when said clamp is in a first position spaced from said box and camming surfaces for said camming means as said connecting means is

operated to decrease the distance between said clamp means and said box to cause said legs to bow outwardly from said box



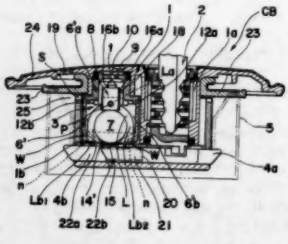
so that the ends thereof may engage the rear face of said supporting wall so as to secure said box thereto.

4,390,106
Patent Not Issued For This Number

4,390,107
FUEL TANK CAP FOR MOTOR VEHICLE

Masakazu Hukuta, Tsushima, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation-in-part of Ser. No. 101,248, Dec. 7, 1979, abandoned. This application Apr. 30, 1981, Ser. No. 259,055
Claims priority, application Japan, Oct. 21, 1980, 55-150644[U]
Int. Cl.³ B65D *51/16, 55/14*
U.S. Cl. 220—202 **3 Claims**



1. A fuel tank cap for use in a motor vehicle including a cap body having a path communicating the interior of a fuel tank with the atmosphere and having incorporated therein a sensor valve unit, said sensor valve unit comprising:

a valve housing having an upper wall with a first through-opening therein open to said path for communication with the atmosphere, a peripheral wall having a second through-opening at a predetermined portion thereof and open to said path for communication with the interior of the fuel tank, and a bottom wall having a funnel shape,

a weight ball movably placed on said bottom wall for rolling motion thereover,

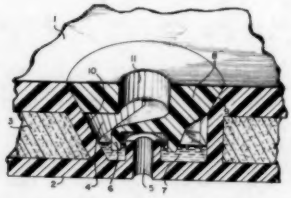
a plunger type valve body resting on the weight ball, and

an arm member fitted around diametrically opposite side portions of the peripheral surface of said weight ball, and pivotally connected to said valve body, said valve body being raised by said weight ball following upward movement of said weight ball during its rolling motion on said bottom wall so as to close said first through-opening in said upper wall, and being forcibly lowered by said arm member following downward movement of said weight ball during its rolling motion on said bottom wall so as to open said first through-opening.

4,390,108
COVER FOR A HOT LIQUID CONTAINER

Dieter Knoll, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,384
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044845
Int. Cl.³ B65D *53/06*
U.S. Cl. 220—228 **3 Claims**



1. A cover for a hot liquid container comprising:

an upper member having a first aperture;

a lower member disposed beneath said upper member;

wall means connecting said upper member to said lower member and defining a feed chamber;

an upstanding member positioned in said feed chamber and connected to said lower members, said upstanding member defining a second aperture providing fluid communication between said feed chamber, through said upstanding member and said lower member and to said hot liquid container; and

an insert having a third aperture formed therethrough and capable of being inserted in said feed chamber through said first aperture, said third aperture forming a fluid communication from outside said cover to said second

aperture of said upstanding member, said insert including a wall portion which, when said insert is inserted in said feed chamber, is disposed about at least a portion of said upstanding member of said lower member, whereas a liquid poured into said third aperture forms a liquid blocking layer in said feed chamber before the liquid travels through said second aperture to the associated hot liquid container.

4,390,109

KEEP-FRESH STORAGE CONTAINER WITH LID

Rolf-Günter Schülein, Singhofen, and Leonard Hagedorn, Niederneisen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

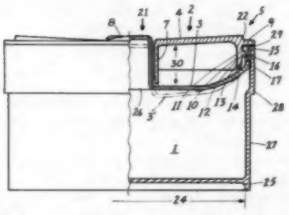
PCT No. PCT/DE81/00096, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00126, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 24, 1981, Ser. No. 359,716

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025200

Int. Cl.³ B65D *53/00*

U.S. Cl. 220—234 10 Claims



1. Keep-fresh storage container comprising a container and a detachable, elastically deformable, curved lid, which is provided in the middle with a handle and is provided with a rim, and which by alteration of the curvature of the lid can be deformed in such a manner that it can lie either with clearance or with close contact against the edge of the container, characterised in that the handle is in the form of handle webs (4) which merge into the rim (5), while a curved, deformable lid part (3), which is provided approximately in the centre with an operating member (8), acts on the rim (5) lying on the container edge (29).

4,390,110

HANDLE INTERLOCK FOR A TRASH CAN LID

Armand Pirro, Leominster, Mass., assignor to Cosco, Inc. (Tucker Housewares Div.), Leominster, Mass.

Filed Apr. 22, 1982, Ser. No. 370,679

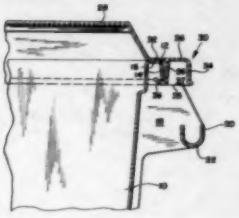
Int. Cl.³ B65D *45/00*

U.S. Cl. 220—318 10 Claims

1. A plastic locking lid for a plastic open top container having a peripheral rim with a downturned edge thereon, spaced from the periphery thereof, forming an inverted U-shaped channel at the edge of the container top,

said lid having a peripheral rim including an outwardly extending portion and a peripheral downwardly extending portion at its edge,

the downwardly extending lid rim portion encompassing the U-shaped edge channel of the container with the lid applied to the container,



a latch releaseably locking the lid to the container at the downturned edge thereof,

an outstanding handle on the container,

a pair of upright circumferentially spaced walls on the container encompassing the handle,

and a vertical slot at the top portion of each wall, the downwardly extending lid rim portion being engaged in the slots when the lid is locked to the container.

4,390,111

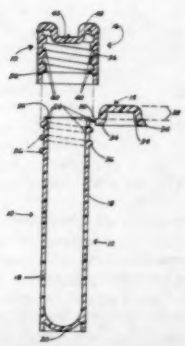
SEALABLE VIAL

Arthur J. Robbins, Mountain View; Paul B. Robbins, Palo Alto, and Dennis C. Thompson, Campbell, all of Calif., assignors to Robbins Scientific Corporation, Mt.View, Calif.

Filed Feb. 8, 1982, Ser. No. 346,488

Int. Cl.³ B65D *43/16, 43/18, 51/18*

U.S. Cl. 220—259 15 Claims



1. An improved sealable vial compromising:

a tubular body sealed at one end and having an aperture formed at the opposite end;

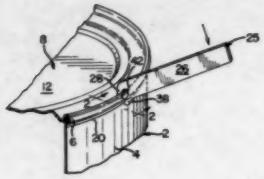
a deformable sealing insert attached to the tubular body for mating with the tubular body in the vicinity of said aperture and forming a seal therewith; and

a cap for attachment to the tubular body so as to enclose the sealing insert and secure the vial in a closed mode.

4,390,112
EASY OPENING CONTAINER AND OPENER TOOL THEREFOR

Oliver J. Tysver, Flossmoor, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 23, 1981, Ser. No. 314,167
Int. Cl.³ B65D *17/36*
U.S. Cl. 220—274 **10 Claims**

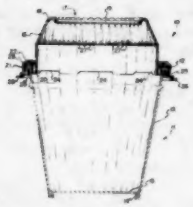


1. The combination of a can having a body and an end member seamed together in a chime, a weakening score encircling said body immediately below the chime, a tool for fracturing said score and removing said end member and a portion of said body between said score and chime to open said can, said tool having a jaw with inner and outer portions embracing said chime and operative attendant to movement of said tool in one direction to fracture said score, said tool having means engageable under said chime to permit lifting of the tool to fracture the entire score and separate the can portion above the score from said body.

4,390,113
CONTAINER LID HAVING VENT MEANS

Stanford W. Bird, 745 E. 3 Fountain Cir. #36, Salt Lake City, Utah 84107

Filed Mar. 1, 1982, Ser. No. 353,217
Int. Cl.³ B65D *41/16, 41/18, 51/16*
U.S. Cl. 220—306 **1 Claim**

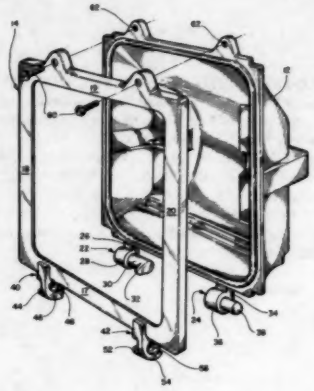


1. A one-piece lid for a container comprising
a flat closure surface;
a wall flaring outwardly from said flat closure surface whereby said flat base surface and said wall form a dish, said wall terminating in an inner flange and an outer flange spaced from but connected to said inner flange;
bead members spaced around the outer flange and projecting inwardly therefrom;
notches formed in the inner flange, said notches having a length greater than the bead members and being spaced oppositely therefrom;
a shoulder interconnecting the inner and outer flange members;
grooves formed in the shoulder interconnecting the inner and outer flange members, said grooves extending beyond the adjacent ends of the adjacent notches and bead members; and
a flared rim extending outwardly from the outer flange to provide finger gripping means for removal of the lid from a container.

4,390,114
HINGE CONSTRUCTION FOR ELECTRICAL ENCLOSURES

Nicolas N. Sviatoslavsky, Greendale, and Charles A. Kelpin, South Milwaukee, both of Wis., assignors to Appleton Electric Company, Chicago, Ill.

Filed Nov. 16, 1981, Ser. No. 321,806
Int. Cl.³ B65D *93/14, 51/04*
U.S. Cl. 220—337 **5 Claims**



1. An improved electrical enclosure, comprising:
a concave housing for containing electrical paraphernalia and a cover therefor,
each of said housing and cover having a pair of spaced apart appendages,
the pair of appendages on one of said housing and cover each including a pin both in axial alignment with the other pin and also cantilevered outwardly in the same direction as the other pin,
the pair of appendages on the other of said housing and cover each including a transverse hole therethrough in axial alignment with the other hole and of a size and shape and so positioned as to permit said pins and holes to matingly assemble together and permit said cover to pivot relative to said housing,
and means forming a part of one appendage on the housing and also forming a part of its mating appendage on the cover for captivating the cover and housing together over a substantial portion of the relative pivotal movement between cover and housing and for releasing the cover axially of said pins only over a specific and limited angle between cover and housing.

4,390,115
CAULKING GUN

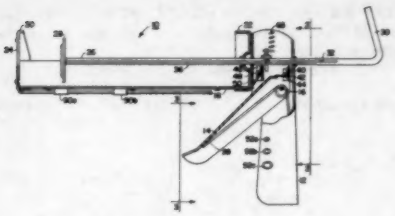
Bobby J. Bigham, Arlington, Tex., assignor to James M. Peppers, Houston, Tex.

Filed Mar. 30, 1981, Ser. No. 249,112
Int. Cl.³ B67D *5/42*
U.S. Cl. 222—326 **12 Claims**

1. A hand operated caulking gun having a housing, a U-shaped handle attached with said housing, a U-shaped squeeze trigger mounted about a pivot in said handle with pawl means to ratchet a plunger rod and a displacement head into the inlet of a caulking cartridge disposed in said housing, comprising:
(a) single hand actuated release means of construction suitable for rotating said plunger rod out of engagement with

said pawl means while said gun is held solely by said single hand to release any force imposed by said rod against said displacement head;

(b) a piercing blade and seal means mounted in swiveled relation about the outlet end of said housing for piercing the closure diaphram of the caulking cartridge and thereafter sealing said caulking cartridge nozzle and said diaphram to seal the cauking cartridge between the occasions that caulking compound is extruded from said cartridge through said nozzle;



(c) a plurality of cutting holes of different size defined in said handle with said holes being generally oval in shape and having edges bevelled toward the inside to form a sharp edge on the inner side of the handle to form a sharp shear with a cooperating edge of said trigger when said trigger is depressed into said handle and with said shearing hole being oval shaped so as to receive and visually fit the round plastic caulking cartridge nozzle at an appropriate caulk dispensing angle; and

(d) said shearing edges of said cutting holes being flame hardened.

4,390,116

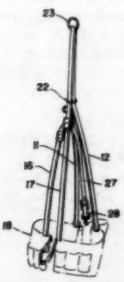
TOOLBAG SUSPENDERS AND HOLDER

Richard B. Fehr, P.O. Box 791, Lafayette, Calif. 94549

Filed Jun. 12, 1981, Ser. No. 273,020

Int. Cl.³ A45F 5/00; A45C 13/30

U.S. Cl. 224—209 **1 Claim**



1. A suspender assembly for supporting a tool bag disposed about the waist of an individual, comprising; a pair of strap members adapted to be draped over the shoulders of the individual, said strap members including front portions extending generally vertically and joined to confronting, adjacent front portions of the tool bag, said strap members including back portions which cross and are joined to opposite adjacent back portions of the tool bag, double ring detent assembly means for adjustably determining the point of intersection of said back portions and for suspending the tool bag on said strap members in a generally horizontal, balanced fashion, said double ring detent assembly means including a first ring and a second ring of similar diameters, said strap members passing into and out of the same end of the aperture of said first ring in half-loop fashion, said second ring circumscribing both of said strap members at the half-loop portions in slidable fashion and adjustably defining said point of intersection, said first ring being slidably positionable along said strap members from a detent position in which said rings are abutting and said strap members are bound therebetween at said point of intersection to a non-detent position in which said first ring is spaced apart and disengaged from said second ring and said strap members are freely translated through said second ring to permit the tool bag to hang therefrom in balanced fashion.

4,390,117

LADDER RACK FOR VEHICLE

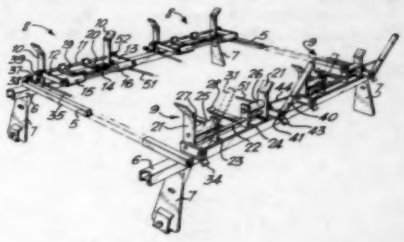
Michael W. Fagan, Mountain View, Kilkerly, Dundalk, County Louth, Ireland

Filed Jun. 29, 1981, Ser. No. 278,346

Claims priority, application Ireland, Jun. 30, 1980, 1375/80; Mar. 26, 1981, 683/81

Int. Cl.³ B60R 9/04

U.S. Cl. 224—310 **9 Claims**



1. A ladder rack for a vehicle roof comprising:

a subframe having means for releasable attachment to the roof of a vehicle, and front and rear ladder support assemblies mounted on the subframe;

each of the front and rear support assemblies comprising:

at least one respective transverse roller for engaging under the stringers of a ladder spanning the two assemblies and at least one respective ladder-retaining member being manually pivotable about a respective transverse axis from a lowered inoperative position to a raised operative position wherein each said member is in a position to engage a rung of a ladder spanning the two assemblies;

said at least one roller of the front assembly further being manually pivotable about a transverse axis for raising and lowering whereby a ladder spanning the assemblies may be brought into a downwardly and rearwardly inclined orientation for on and off loading from the rear of the vehicles.

4,390,118

JAM PREVENTION MEANS FOR HIGH-SPEED WEB HANDLING DEVICE

Joseph J. Gardner, Jr., 18557 Bowie Mill Rd., Olney, Md. 20832

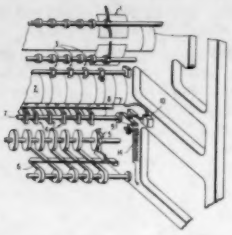
Filed Nov. 25, 1980, Ser. No. 210,189

Int. Cl.³ B65H 25/00, 7/12

U.S. Cl. 226—25 **10 Claims**

1. A jam prevention means for high speed web handling devices comprising a conveyor surface, stripper fingers biased

towards said conveyor surface, a deflectible shaft on which said stripper fingers are mounted, means to detect a deflection



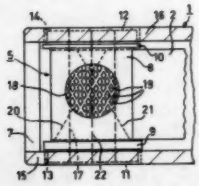
of said shaft and shut down the web handling device thereby preventing a jam.

4,390,119

TAPE GUIDE SYSTEM

Roland Smetana, and Franz Werner, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,360
Claims priority, application Austria, Apr. 4, 1980, 1878/80
Int. Cl.[3] B65H *23/04;* G03B *1/48*
U.S. Cl. 226—196 5 Claims



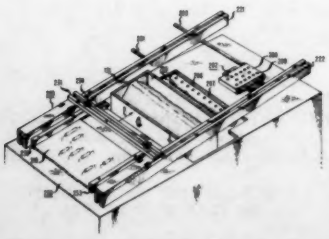
1. A tape guide having a guide surface over which surface a tape is passed, characterized in that the guide surface comprises a coherent network of ridges, said ridges bounding a multiplicity of adjacent circumferentially bounded recesses arranged in a recurrent pattern.

4,390,120

SOLDERING METHODS AND APPARATUS

Alfred P. Broyer, Hopatcong, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1980, Ser. No. 216,372
Int. Cl.[3] H05K *3/34;* B23K *1/08*
U.S. Cl. 228—180 R 6 Claims



1. In combination with means for wave soldering a printed wiring board apparatus characterized by

heat dissipation means (200), including a first pressurized gas, for directing said first gas to a transverse strip on the underside of said board as it exits the solder wave, and

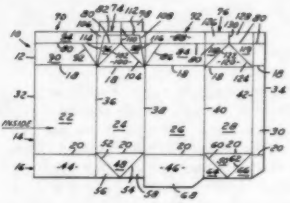
cooling means (202), including a second pressurized gas, for directing said second gas to a region on said underside only along substantially the centerline of said board as it exits said dissipation means.

4,390,121

CONTAINER AND BLANK FOR CONSTRUCTING SAME

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 7, 1981, Ser. No. 309,357
Int. Cl.[3] B65D *5/72*
U.S. Cl. 229—17 G 13 Claims



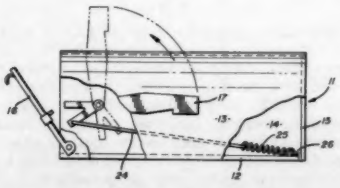
1. A plastic coated paperboard blank for a container, said blank comprising four bottom closure panels, four side panels, a pair of lower top closure panels connected to alternate said side panels, a pair of upper top closure panels terminating in aligned edges connected to said lower top closure panels, a pair of substantially triangular gable panels connected to the other alternate said side panels, a pair of substantially triangular fold-back panels flanking each of said gable panels, a pair of infold lips terminating substantially along said aligned edges connected to each of said pair of fold-back panels, a flap connected to a selected one of the four panels consisting of said pair of upper closure panels and said pair of panels each bearing a pair of infold lips, and a lateral slit formed across said selected one of the four panels for a distance beneath said flap less than the full width of said flap, and said flap having a height extending outward from said aligned edges sufficient for the flap to cover said lateral slit when folded down thereon.

4,390,122

AUTOMATIC SIGNAL FLAG ATTACHMENT FOR A MAILBOX

Michael J. Savko, 44 S. Bon Air Ave., Youngstown, Ohio 44509

Filed Jul. 9, 1981, Ser. No. 281,886
Int. Cl.[3] B65D *91/00*
U.S. Cl. 232—35 1 Claim



1. An automatic signal flag attachment for use on a mailbox comprises, in combination, a mailbox having an opening in one end and a hinged door therefor movable toward and away from said opening, a V-shaped lever apertured at its apex, a pivot sleeve and an apertured signal flag, said V-shaped lever,

pivot sleeve and signal flag assembled in fixed relation to one another on a two part bolt positioned through an aperture in said mailbox adjacent said opening, means urging said V-shaped lever, pivot sleeve and signal flag to a first position, said means including a spring and rod assembly secured to said V-shaped lever and to said mailbox, a trigger device having a clip portion arranged for frictional attachment to said door, a member on said trigger device normally engaging said V-shaped lever between the arms of said V-shape, said V-shaped lever and said signal flag being movable to a second position in response to movement of said V-shaped lever when said trigger device is moved with said door away from said V-shaped lever.

4,390,123

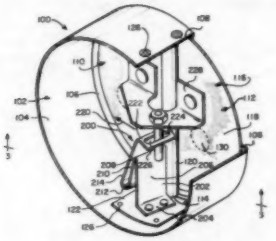
THERMALLY ACTIVATED, AUTOMATIC, SINGLE BLADE DAMPER AND DAMPER OPERATOR

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 211,914, Dec. 1, 1980, Pat. No. 4,372,485. This application Jan. 30, 1981, Ser. No. 229,829

Int. Cl.³ G05D *23/00*; F23H *3/00*

U.S. Cl. 236—16 **15 Claims**



1. For a damper having a frame and a reciprocal blade operatively associated with the frame, an improved damper operator comprising:

a. a bimetallic element, one end of which is fixedly connected to the frame; and

b. a linkage, pivotally connected to another end of the bimetallic element and attached to face portions of the blade of the damper;

so that reciprocating movement of the bimetallic element causes the blade to rotate within the damper frame.

4,390,124

HEATING AND VENTILATION SYSTEM FOR VEHICLES

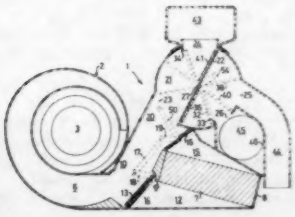
Sten E. Nilsson, Vargön, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Feb. 23, 1981, Ser. No. 237,109

Claims priority, application Sweden, Feb. 27, 1980, 8001514

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 A **5 Claims**



1. In a heating and ventilating system for a vehicle, a housing comprising two housing halves connected along a longitudinal plane, said housing enclosing heat exchanger means, an air inlet chamber and fan means for passing outside air into the inlet chamber; a longitudinal intermediate wall mounted between the housing halves, said wall at least partially separating the space between the housing halves into two part spaces; and in each part space: a cold air duct in communication with the inlet chamber and with a mixing chamber, a hot air duct for passing selecting portions of air from the cold air duct through the heat exchanger means to the mixing chamber, a substantially cylindrical distribution chamber in communication with the mixing chamber and with a plurality of outlets leading to different parts of the interior of the vehicle, said distribution chamber including a distribution flap disposed in a diametric plane in the distribution chamber and pivotable about the axis of the distribution chamber for selectively directing air to any of said outlets.

4,390,125

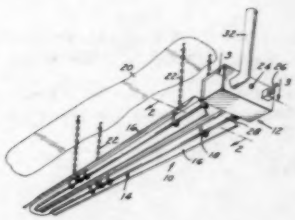
TUBE-FIRED RADIANT HEATING SYSTEM

Mario Rozzi, St. Clair Shores, Mich., assignor to Detroit Radiant Products Company, Detroit, Mich.

Filed Feb. 12, 1981, Ser. No. 233,838

Int. Cl.³ F24H *3/00*

U.S. Cl. 237—70 **7 Claims**



1. A tube-fired radiant heating system comprising an elongated radiant heating tube having an inlet end and an exhaust end, a relatively short tube of smaller diameter than said elongated tube and spaced from the inner surface thereof to define therewith a cylindrical passage for flow of air, a burner positioned within said relatively short tube, said burner having an inlet end to receive air and fuel, means for mixing air and fuel, and an exit end for emitting the air/fuel mixture for combustion closely adjacent thereto, a pressurized housing defining an air tight compartment in gaseous communication with said inlet end of the elongated tube and the inlet end of the burner, and blower means for continually forcing air into said pressurized housing and through said cylindrical passage to form a cylinder of air around burning air/fuel mixture emitted from the burner to shield said elongated tube from impingement of the flame of burning air/fuel mixture.

4,390,126

PROCESS FOR SUPPLYING PAINTING LINES WITH PAINT

Hagen Buchholz, Münster; Hans-Dieter Johannsmeier, Nottuln, and Friedrich Vock, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,872

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923906

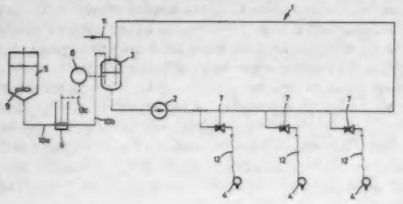
Int. Cl.³ B05D *1/02*; B05C *21/00*; B05B *7/32*

U.S. Cl. 239—1 **15 Claims**

1. A process for supplying coating material to at least one spraying point located along a paint line, comprising:

(a) providing said paint line as a closed circuit;

(b) locating a pressurized vessel having an inlet and an outlet in said closed circuit;
(c) supplying said pressurized vessel with said coating material under pressure to maintain a liquid level in said pressurized vessel;



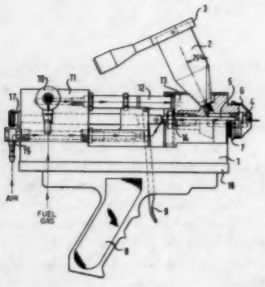
(d) supplying a pressurized gas above said liquid level in said pressurized vessel to maintain a pressure level on said coating material for paint spraying at said spraying point; and
(e) providing a pump in said closed circuit for recirculating said coating material from said spraying point to said pressurized vessel.

4,390,127

SPRAYING GUN FOR METAL SPRAYING

Paul Behrend, Sonnenbergstrasse 53, D-6508 Alzey 3, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,266
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014177
Int. Cl.³ B05B 1/24
U.S. Cl. 239—83 **3 Claims**



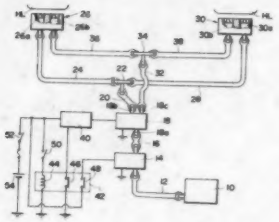
1. A metal spraying gun comprising: a unitary housing; a handle for the housing; a heat insulating layer between the housing and the handle to prevent the passage of heat from the housing to the handle; an adjustable spray nozzle having an outlet positioned at the forward end of the housing; a fuel gas burning chamber in the housing positioned above and rearwardly of the spray nozzle; a heatable container for the material to be sprayed through the nozzle, said container being carried at an angle at the forward end of the housing rearwardly of the spray nozzle and having one end thereof extending into the gas burning chamber of the housing; a gas heating device positioned in the housing rearwardly with relation to the gas burning chamber, said gas heating device including a fuel gas inlet valve at the rear of the housing connectable to a source of fuel gas and a longitudinally extending gas burner tube in communication with the fuel gas inlet valve and the gas burning chamber; a single, longitudinally extending pressurized air passageway in the housing positioned below the gas heating device for entraining material from the heatable container, said passageway being in communication with pressurized air inlet means at the rear of the housing and with a pressurized air chamber positioned in the housing rearwardly of the spray nozzle; a needle valve extending parallel to the longitudinal axis of the housing from a rear portion of the housing to the nozzle outlet for controlling the flow of material through the nozzle; a pressurized air control valve in the housing in communication with the pressurized air source and the pressurized air chamber for regulating the flow of pressurized air to the nozzle outlet and trigger means adjacent to the handle for actuating the pressurized air control valve and subsequently the longitudinally extending needle valve.

4,390,128

HEAD LAMP WASHING SYSTEM

Tadashi Fujikawa, Tokyo, and Masami Goto, Koganei, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 97,384, Nov. 26, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,749
Claims priority, application Japan, Dec. 11, 1978, 53-153287
Int. Cl.³ B60S 1/56
U.S. Cl. 239—284 A **3 Claims**



1. A head lamp washing system comprising:
(a) a cistern containing a liquid detergent;
(b) a pump;
(c) a solenoid valve having an inlet, and first and second outlets, said solenoid valve inlet connected through said pump to said cistern, said solenoid valve being in a position providing communication between its inlet and its first outlet when energized and in a second position providing communication between its inlet and its second outlet when de-energized;
(d) a first injector having first and second nozzles connected to said first and second outlets of said solenoid valve, respectively, said first injector disposed near a first head lamp for discharging the liquid detergent against said first head lamp;
(e) a second injector having first and second nozzles connected to said first and second outlets of said solenoid valve, respectively, said second injector disposed near a second head lamp for discharging the liquid detergent against said second head lamp; and
(f) a control circuit for periodically changing the position of said solenoid valve, said control circuit adapted to energize said solenoid valve for a predetermined period.

4,390,129

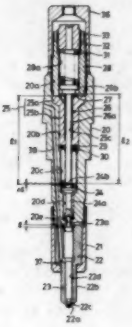
DOUBLE-INJECTION TYPE FUEL INJECTION VALVE

Kazuo Uchida, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,461
Claims priority, application Japan, May 25, 1981, 56-75337[U]
Int. Cl.³ F02M 45/08
U.S. Cl. 239—533.5 **4 Claims**

1. A fuel injection valve comprising: an injection nozzle

having a nozzle needle liftable in response to fuel pressure; a nozzle holder supporting said injeciton nozzle; a first nozzle spring and a second nozzle spring arranged within said nozzle holder; a first movable spring seat supporting said first nozzle spring; a second movable spring seat supporting said second nozzle spring, said second movable spring seat having one end disposed in facing relation to said first movable spring seat and adapted to have said one end spaced from the latter by a predetermined gap when said nozzle needle is in a seated position thereof; whereby lifting of said nozzle needle from said seated position thereof causes corresponding lifting of said first movable spring seat against the force of said first spring through a lift determined by said predetermined gap to effect an initial injection, and further lifting of said nozzle needle causes said first movable spring seat to urgingly displace said second movable spring seat against the combined force of said first and second springs to lift said second movable spring seat to effect a main injection; a spacer removably fitted in a bore formed in an end face of said nozzle holder remote from said injection nozzle, said spacer having an inner end face urgingly engaging



said first nozzle spring to impart urging force to said first movable spring seat; a hollow threaded member having an internal space and removably threadedly fitted in said nozzle holder at a location outward of said spacer and disposed in tight contact with said spacer to retain same in place; said second movable spring seat having an enlarged portion arranged within said internal space of said hollow threaded member in facing relation to an outer end face of said spacer and a rod portion extending integrally from said enlarged portion and slidably fitted through an axial through bore formed in said spacer; said second nozzle spring being arranged within said internal space of said hollow threaded member and urging said second movable spring seat toward said first movable spring seat; a first shim interposed between said spacer and said first nozzle spring for adjusting the setting load of said first nozzle spring; and a second shim interposed between said enlarged portion of said second movable spring seat and said spacer for adjusting said predetermined gap for initial injection lift between said first movable spring seat and said second movable spring seat.

4,390,130

ELECTROMAGNETICALLY ACTUATABLE VALVE

Mathias Linssen, Schesslitz, and Jürgen Peczkowski, St. Ingbert-Oberwurzbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

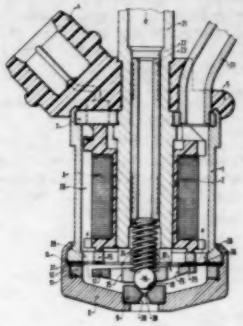
Filed Nov. 14, 1980, Ser. No. 207,055

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948874

Int. Cl.³ F16K *31/06*

U.S. Cl. 239—585 **7 Claims**

1. An electromagnetically actuatable valve for fuel injection systems of internal combustion engines, including a housing, a magnetic element in said housing, a flat armature positioned relative to said magnetic element for operation by said magnetic element, said flat armature having a side, a movable valve element and a fixed valve seat in said housing, said armature being firmly connected with said movable valve element which in turn cooperates with said fixed valve seat in said housing, a remnant air disc of nonmagnetic material fixed in said housing along an edge of said disc and disposed between said flat armature and said magnetic element, said remnant air



disc including recesses therein and a portion extending between said recesses therein that form a spring element, said spring element being fixedly attached to said side of said flat armature at only one location, said spring element being attached to said flat armature to provide a pivotal movement for said armature about said one location, and a closing spring disposed between said armature and said magnet element which produces a force counter to said pivotal movement of said armature.

4,390,131

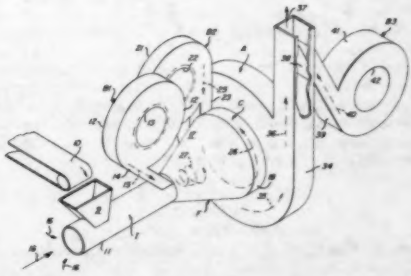
METHOD OF AND APPARATUS FOR COMMINUTING MATERIAL

Jack D. Pickrel, 12621 W. Dakota Dr., Lakewood, Colo. 80228

Filed Feb. 9, 1981, Ser. No. 232,536

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—1 **29 Claims**



1. A method of comminuting material comprising:

producing a flow of air longitudinally through a circular passage in the direction of a connected chamber which expands in size toward a connected cylindrical chamber;

producing a flow of air tangentially of said cylindrical chamber in order to produce a spiral flow in said expanding chamber, a lower pressure centrally of said expanding chamber and a higher pressure toward the periphery of said expanding chamber;

feeding material to be comminuted into said circular passage;

producing the discharge of air and material essentially tangentially from a generally annular chamber having an outer diameter exceeding the outer diameter of said cylindrical chamber, said annular chamber being connected to said cylindrical chamber;

preventing the flow of air and material through an axial, circular central portion of said cylindrical chamber; and

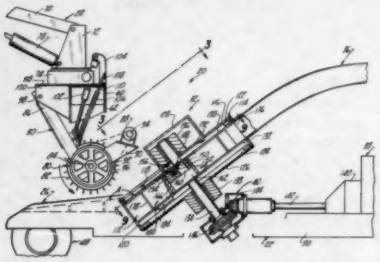
preventing the flow of air and material in a portion of said generally annular chamber beginning generally at said central circular portion of said cylindrical chamber and expanding radially in an axial direction in said generally annular chamber.

4,390,132

WOOD CHIPPER

Marvin R. Hutson, and Louis G. Dutmers, both of Remus, Mich., assignors to Omark Industries, Inc., Portland, Oreg.

Filed Feb. 9, 1981, Ser. No. 232,696
Int. Cl.³ B02C *18/16*
U.S. Cl. 241—55 **23 Claims**



1. Apparatus for reducing material such as felled trees, limbs, branches, and brush to chips comprising means underlying for carrying and guiding such material forwardly in a generally linear path to a work station, a rotor in said work station having a chipper disc with its front face lying in said feed path, means mounting said rotor to rotate about an axis such that the portion of said front face of said disc which engages such material extends across the feed path and slopes upwardly generally in the direction of the forward feed of such material at an obtuse included angle between said portion of said front face and said direction of feed in the range of about 125° to 160°, at least one knife disposed generally radially on and carried by said disc for cutting such material into chips as said chipper disc rotates, and drive means constructed and arranged to rotate said rotor in the one direction of rotation in which said knife is swept across the leading end of such material so that the leading end of such material tends to be lifted from said means for guiding such material and moved in generally the same direction in which such material is forward fed along said path toward said rotor.

4,390,133

FOOD PROCESSOR

David J. Wanat, Meriden, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,676
Int. Cl.³ A47J *43/25*
U.S. Cl. 241—93 **5 Claims**

1. A food processor of the slicer/shredder type having an L-shaped upstanding base housing with a top and an electric motor therein, a rotatable generally horizontal shaft in the upper housing portion drivingly connected with said motor and with its axis aligned to extend centrally over the L, a separate chute offset from the upstanding base and operatively locked to extend above and long enough to substantially fill the space over the L to said base top, a cylindrical hollow cutter disposed in one end of said chute, a driving connection between said shaft and cutter, an axially aligned outlet in said chute at and adjacent said cutter, a clutch around said shaft rotatably connecting said chute and housing, said clutch comprising,

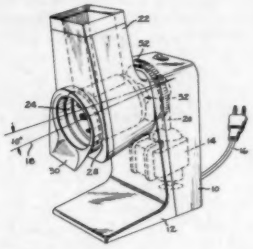
an annular collar having an inner periphery and fixed in said one chute end opposite said chute outlet,

said driving connection extending through said collar to drive said cutter,

plural segmented openings around the inner collar periphery,

one of said openings having a radial notch at one end thereof,

peripheral spaced stops on the cutter side of said collar,



a protruding ring on said base,

radial tabs including a finger for said notch disposed on said ring and dimensioned to match said segments,

control lock means connecting said chute and housing adjacent said clutch so the chute may be partly rotated in one direction from vertical whereby a stop engages one side of said finger and

said segments and tabs line up for chute removal and

the chute may be rotated in the other direction into vertical operative position and locked by said control means, and

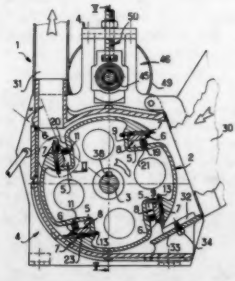
may be further rotated beyond substantially 180° from vertical whereby a stop engages the other side of said finger for aligning and locking said chute and housing together box-like for compact inoperative storage.

4,390,134

UNDERGROWTH CRUSHER

Marcel L. A. Paulve, Moulin des Serres, 83490 Le Muy, France

Filed Aug. 25, 1980, Ser. No. 180,909
Claims priority, application France, Aug. 30, 1979, 79 21797
Int. Cl.³ B02C *18/06*
U.S. Cl. 241—101.2 **6 Claims**



1. A crusher comprising a drum having a peripheral surface and mounted for rotation on a shaft supported by a crusher

frame, said drum being provided on its periphery with several longitudinal slots substantially uniformly spaced from each other, said slots each having opposed lateral surfaces and forming a housing for a respective cutting device; an inlet conduit for introducing objects to be crushed; an outlet conduit for discharging the crushed objects; a drive system for rotating said drum; several cutting devices housed within respective ones of said slots, each cutting device being constituted by a blade/counter-blade assembly including a blade having a pair of opposed faces and a bevelled side forming a cutting surface and an associated counter-blade against which one of said opposed faces of said blade bears, said counter-blade being in the form of a substantially parallelepipedic block having a flange on the rear side thereof; tightening means for urging each said blade/counter-blade assembly against one of said lateral surfaces of the respective slot in which it is housed; and a respective device cooperating with each of said blade/counter-blade assemblies for adjusting the height of each blade with respect to the counter-blade associated with it and the location of said blade/counter-blade assembly in its respective slot with respect to the peripheral surface of said drum, each of said height adjusting devices being entirely supported by said counter-blade, each of said height adjusting devices being constituted by at least two screws which extend through respective bores formed in said flange of the counter-blade so that one end of each screw abuts against the end surface of the associated blade which is opposite from its cutting surface, and wherein said tightening means are constituted by at least one screw partially threaded at one end into a threaded bore of the counter-blade and having a free other end which is pressed against the other lateral surface of said slot to urge a face of the associated blade against said one of said lateral surfaces of said slot.

4,390,135

BAG REMOVAL APPARATUS

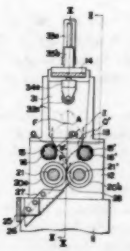
Atsuyuki Wakamatsu, Shimizu, and Keisuke Tonooka, Shizuoka, both of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,085

Claims priority, application Japan, Mar. 28, 1980, 55-41017[U]

Int. Cl.³ B02C *18/16*

U.S. Cl. 241—101.2 **16 Claims**



1. Apparatus for removing an elongated bag having a longitudinal slit from an article enclosed in such bag, said apparatus comprising:

(a) a frame;

(b) a pair of elongated support rolls mounted to said frame for receiving said bag with said article therein and contiguously supporting same to preclude movement of said article beyond said rolls, said rolls being substantially horizontal and being spaced from one another to define a nipless passage therebetween;

(c) means for urging said article downwardly to engage portions of said bag with said support rolls;

(d) means for rotating said support rolls relative to said frame in opposite directions to draw said bag from said article and advance it through such nipless passage; and

(e) nip-defining roller means supported by said frame downwardly of said nipless passage and non-contiguous with respect to said article for advancing said bag from said nipless passage.

4,390,136

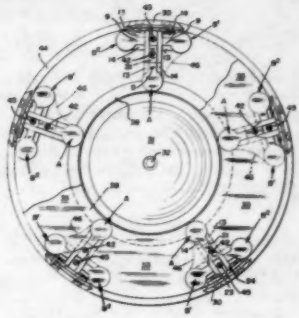
REPLACEMENT WEAR PINS AND REPLACEABLE IMPELLER ASSEMBLY FOR IMPACT CRUSHER

John H. Burk, 712 Charlton Dr., Pleasant Hill, Calif. 94523

Filed Jul. 17, 1981, Ser. No. 284,471

Int. Cl.³ B02C *19/11*

U.S. Cl. 241—275 **4 Claims**



1. In a rock crusher having an impeller assembly formed with a circumference mounted on a turntable having a rim which is connected to and driven by a vertical drive shaft comprising:

a. a plurality of replaceable metal wear pins mounted in said impeller assembly and each of said pins consists of a generally cylindrical portion formed with a projection extending therefrom and terminating in a generally planar end face and said pins terminate at both ends in generally planar end faces and each end of said projections is formed with a pair of spaced lug indents; and

b. said wear pins are positioned on a peripheral outer band of said impeller in groups of three including a head pin and two heel pins wherein said projections form a T-shape having a stem and a cross with said stem of said T located on a radial line and said cross located adjacent said circumference of said impeller, said pin located on said radial line being designated as said head pin and said pins located on said cross being designated as said heel pins.

4,390,137

FORMING A STRAND PACKAGE HAVING MULTIPLE COIL LENGTHS

Charles S. Hammond, Jr., and Henry D. Mitchell, Jr., both of Winston-Salem, N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,236

Int. Cl.³ B65H *75/24, 54/10, 55/04*

U.S. Cl. 242—54 R **14 Claims**

1. Apparatus for forming a strand package having multiple coil lengths, which comprises:

rotatable, collapsible reel means for winding a strand extending from a strand supply;

means for expanding the reel means into an expanded condition for a winding operation;

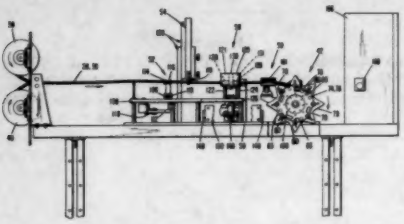
means for rotating the reel means to wind the strand from the strand supply onto the reel means;

means for causing relative shifting of the strand and the reel means to cause winding of preselected coil lengths of the

strand onto respective winding sections of the reel means in sequence, to form the strand package;

means for collapsing the reel means to facilitate removal of the formed strand package from the reel means; and

means for separating the reel means into the winding sections, the separating means being movable into an extended condition for separating the reel means into the winding sections, and into a retracted condition to facilitate removal of the strand package from the reel means, and a part of the separating means forming a part of the means for expanding and collapsing the reel means.



4,390,138

REELING APPARATUS FOR A WEB

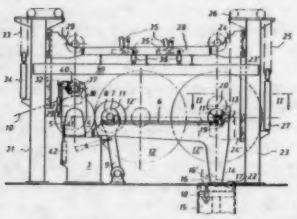
Günter Rohde, Zang, and Friedrich Kuhn, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,879

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015547

Int. Cl.³ B65H *75/02, 17/08*

U.S. Cl. 242—55 **22 Claims**



1. A reeling apparatus for reeling a web on a winding shaft having a core tube fitted over it, said reeling apparatus comprising:

an application station for winding a web onto a core tube fitted over a winding shaft to form a roll around the core tube;

first moving means for moving the roll from said application station to an extraction position for enabling extraction of the winding shaft from the core tube when the roll is at said extraction position, said first moving means comprising second moving means for raising the roll into said extraction position to enable extraction of the winding shaft, and for then moving the roll away from said extraction position; said second moving means being adapted and positioned to engage the periphery of the roll and to not engage the winding shaft and the core tube;

extraction means for extracting the winding shaft from the core tube while the roll is in said extraction position, said second moving means being adapted to maintain the roll in said extraction position while engaging the periphery of the roll, while said extraction means extracts the winding shaft from the core tube;

refitting means for fitting a new core tube on the winding shaft after the winding shaft has been extracted from the roll; and

conveyor means for returning the winding shaft to said application station.

4,390,139

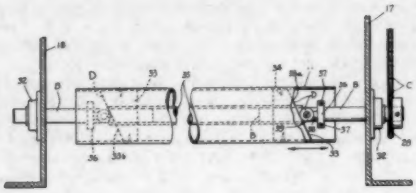
OSCILLATING GUIDE ROLL ASSEMBLY FOR CLOTH WINDER

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Filed Aug. 6, 1981, Ser. No. 290,612

Int. Cl.³ B65H *17/08, 17/12;* D03D *49/20*

U.S. Cl. 242—66 **3 Claims**



1. For use in a cloth winder having a driven cloth takeup roll, an assembly including an oscillating guide roll over which said cloth passes prior to the takeup roll comprising:

a tubular roll member aligned transversely of the passage of a width of cloth in contact with the cloth as it comes to the winder;

means mounting said tubular roll for rotation responsive to said contact with the cloth and for longitudinal sliding movement between said tubular roll and said mounting means;

means driving said mounting means at a predetermined speed differential to and in the same direction of rotation of the tubular roll; and

cam means between said tubular roll and said mounting means for imparting an oscillatory movement to said tubular roll relative to said mounting means in accordance with the speed differential.

4,390,140

CENTRIFUGAL BRAKE FOR FISHING REELS

Jarding U. Karlsson, Svängsta, and Börje S. Moosberg, Mörrum, both of Sweden, assignors to ABU Aktiebolag, Sweden

Filed Mar. 11, 1981, Ser. No. 242,766

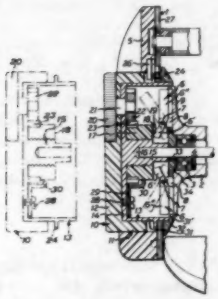
Claims priority, application Sweden, Mar. 18, 1980, 8002091

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—84.52 C **3 Claims**

1. A fishing reel comprising a frame, a line spool (2) having opposite end walls and rotatably supported by said frame, and end wall means (5) supported by said frame and defining with one of said line spool end walls (9) a space therebetween, a centrifugally operated line spool braking device mounted for movement in said space to be centrifugally actuated by rotational movement of said line spool during casting for exerting a braking force thereon, said braking device comprising an annular braking surface (18) supported in said space by said end wall means (5) of said frame and facing said one line spool end wall (9), at least one braking lever (6) housed in said space and pivotally mounted on said line spool (2) outwardly of said one line spool end wall (9), said braking lever (6) having a pivot axis (7) which is spaced from and extends perpendicular to the rotational axis (4) of the line spool (2), and said lever (6) forming a double-armed pivotable braking lever having radially outer and inner arms (6″, 6′), said radiallyouter arm (6″) forming a centrifugal weight which, in an inactive position of said braking lever, projects outwardly from said radially inner

arm (6') in a direction which forms an angle in relation to the rotational axis of the line spool as well as in relation to a radius extending from said rotational axis of the line spool through said pivot axis of the lever, said lever having a radially inner end portion, which portion which forms a braking member (19) of said braking lever, said annular braking surface (18) being supported by said end wall means (5) of said frame in a suitable position to be contacted by said braking member (19) when centrifugal forces acting on said radially outer arm (6") tend to pivot said radially outer arm in a direction decreasing said angle between said radially outer arm and said radius from said rotational axis of the line spool through said pivot axis (7) of said lever, whereby said braking lever will exert a braking force on said annular braking surface in dependence on the rotational speed of said line spool, an adjusting mechanism for adjusting the axial position of said annular braking surface (18), said adjusting mechanism comprising a threaded first supporting member (15) connected to said end wall means (5) of said frame, said first supporting member having a threaded portion which is coaxial with said rotational axis of said line spool and also coaxial with said annular braking surface (18), and a second supporting member (17) which supports said annular braking surface (18) and has an inner thread, said second supporting member being mounted on said first supporting member in threading engagement therewith for axially adjusting the position of said braking surface by rotating said second supporting member (17) on said first supporting member (15), said adjusting mechanism comprising an operating member (20) rotatably supported by said end wall means (5) of said base in a position to be manually actuable from the outer side of said end wall means, a first gear (22) rotatably mounted to be actuated by means of said operating member (20), and a second gear (23) fixed to said second supporting member (17) to be operated by said first gear (22) for said adjustment of the axial position of said braking surface (18) by rotating said second supporting member (17), said end wall means (5) of said base comprising a peripheral wall member having a central opening and a lid (10) having means to detachably connect said lid to said wall member in a position to close said opening, said adjusting mechanism including said operating member (20), said first and second gears (22, 23) and said first and second supporting members (15, 17) being supported by said lid and assembled to form a dismountable unit therewith.



4,390,141

STRAP WINDING MECHANISM

Jerald H. Webster, 11200 Des Moines Way, S., Seattle, Wash. 98168

Filed May 26, 1981, Ser. No. 266,633
Int. Cl.³ B65H 17/46, 75/40
U.S. Cl. 242—86.5 R **9 Claims**

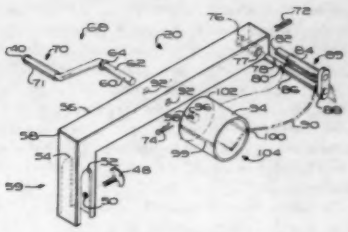
1. A strap winding mechanism for use in connection with a conventional flat bed truck or the like provided with stake holes or the like along the sides thereof,

a substantially L-shaped frame having a first leg which is detachably clamped at its outer end to any selected stake hole of said truck bed;

said frame when so mounted including a second leg standing out from said first leg horizontally away from said truck bed;

said second leg having therethrough a first journal aperture arranged with its axis generally parallel to said truck bed;

a strap reel assembly comprising a reel hub and, extending therefrom, an open-ended cylindrical section on which the strap is windable and from which wound strapping is



readily removable by withdrawal from the open end of such section;

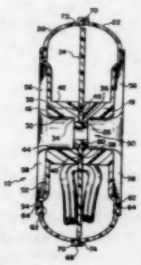
a reel handle including means for detachable connection thereof to said strap reel assembly with said reel handle and said strap reel assembly arranged in said journal aperture on respectively opposite sides of said second leg, the said means for detachable connection of said reel handle to said strap reel assembly enabling ready assembly and disassembly of the reel handle, strap reel assembly and frame for storage of the mechanism when not in use.

4,390,142

CORD REEL ASSEMBLY

Yue C. Cheng, Flat A, 6/F, 8 Broadcast Dr., Kowloon, Hong Kong

Filed Aug. 10, 1981, Ser. No. 291,356
Int. Cl.³ B65H 75/40
U.S. Cl. 242—96 **8 Claims**



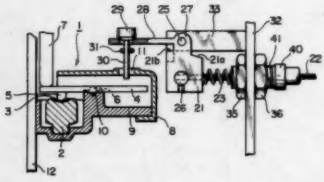
1. A cord reel assembly for receiving a loop of a cord through an opening in the assembly such that the loop can be wound up within the cord reel assembly, said cord reel assembly comprising first and second identical hub-forming members, each hub-forming member having a cylindrical section with an inner end facing toward the inner end of the cylindrical section of the other member and having an annular disc shaped section extending outwardly from said cylindrical section at the outer end thereof, a plate positioned between said inner ends of said cylindrical sections of said hub-forming members, first and second identical annular opposed shell members, each having a generally concave cross section in a radial direction that extends from an inner circumferential

edge thereof upwardly and inwardly toward an outer inwardly positioned circumferential edge where each such shell member abuts the opposed shell member, said disc section of each hub-forming member having an outer circumferential edge which overlaps, on the outside, said inner edge of one of said shell members, means for holding said cylindrical sections together with said plate situated between the inner ends thereof to form a hub assembly with said outer circumferential edge of each said disc section bearing against one of said shell members to hold said shell members in place with the outer circumferential inner edges thereof in abutting relationship, said shell members having means for limiting relative rotation therebetween, each shell member having a notch extending into said shell member from the outer circumferential edge thereof and adapted to register with an opposed identical notch in the opposed shell member, said plate having a radially extending slot therein adapted to be rotated into alignment with said notches when said notches are in registry with each other for forming means for receiving a loop of a cord, and manually manipulatable means on the outer surface of each disc section of each hub-forming member for enabling said hub assembly to be rotated by hand relative to said shell members after a loop of a cord has been inserted through said aligned notches and into said slot for winding up excess cord.

4,390,143
MANUALLY OPERABLE ATTACHMENT FOR THE LOCKING MECHANISM OF SAFETY BELT RETRACTOR

Masayuki Takagi, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 252,072
Claims priority, application Japan, Apr. 16, 1980, 55-051209[U]
Int. Cl.³ A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **7 Claims**



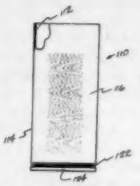
1. In a locking mechanism for use in a safety belt retractor which includes retractor means normally biased in the webbing-retracting direction while allowing webbing withdrawal, locking means adapted to be placed in an engaging position for preventing webbing withdrawal, sensor means for sensing a change in the speed of the vehicle, and transmitting means for actuating said locking means responsive to said sensor means;

the improvement comprising manually operated means for actuating said locking means, said manually operated actuating means comprising a vertically disposed weighted actuating member arranged to actuate said transmitting means independently of said sensor means, a tiltable member holding said actuating member in a normally raised position out of contact with said transmitting means, and means for moving said tiltable member downwardly, thereby allowing said actuating member to contact and actuate said transmitting member, said actuating member being vertically moveable with respect to said tiltable member.

4,390,144
YARN CARRIER

Rolf J. Mueller, Greenville, S.C., assignor to Textube Corporation, Greer, S.C.

Filed Feb. 2, 1981, Ser. No. 230,898
Int. Cl.³ B65H *75/10, 75/26*
U.S. Cl. 242—118.3 **11 Claims**

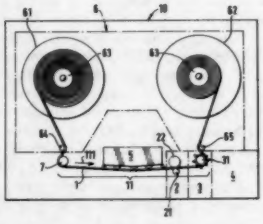


1. An improved yarn carrier, said carrier comprising an elongated body, said body defining an inside wall surface and an outside wall surface, said carrier being receivable on a yarn handling machine where a yarn package may be produced about said carrier body, at least a major portion of said outside wall surface having a yarn receiving and holding area therealong, said area being defined by a plurality of separated, interrelated projections that follow a helical path about said body and cooperate to produce a predetermined uninterrupted design along said area, said design including a plurality of rows of parabolic figures extending around said body whereby a yarn may be wound therearound while precluding entrapment of the yarn between individual projections and precluding sloughing of the yarn from the carrier.

4,390,145
MAGNETIC TAPE HANDLING APPARATUS

Wolfgang Giese, Hasselbrookstrasse 39a, 2000 Hamburg 76, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,566
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006315
Int. Cl.³ B65H *59/38;* G03B *1/04;* G11B *15/32*
U.S. Cl. 242—186 **15 Claims**



1. An apparatus for processing perforated magnetic record tape correctly along a path in respect of time and its position, and synchronism with other video and/or audio data, said apparatus comprising:

tape-winding means;

friction drive means comprising a driven surface and means to press the tape against said surface providing the sole operative tape drive during normal operation;

measuring sprocket means associated with the path of the tape for engaging the perforations in the tape and for being rotated solely by advance of the tape for detecting the position of the tape and providing a position signal;

means providing an input tape control signal;

computer means responsive to said sprocket means position

signal and said input control signal, for comparing said position signal and input control signal to provide a resulting drive control signal for controlling said friction drive means;

magnetic responsive head means adjacent the path of said tape for operatively exchanging information with said tape; and

said tape-winding means and friction driving means only moving said tape tautly stretched only along said path engaging said sprocket means without significant mechanical stressing of said tape by said sprocket means during normal operation involving said head means forwardly at low speed, and backwardly and forwardly at high speed so that the position and speed of said tape are always measured by said sprocket means.

4,390,146

APPARATUS SUITABLE FOR USE IN REMOVING OR REDUCING A CREASE OR TANGLE IN A MAGNETIC RECORDING TAPE OF A CASSETTE

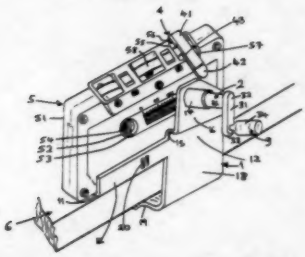
Karim Jorephani, Basra Farm, Shockerwick La., Batheaston, Bath, Avon, England

Filed Mar. 18, 1981, Ser. No. 245,050

Claims priority, application United Kingdom, Jul. 29, 1980, 8024685; Aug. 15, 1980, 8026667

Int. Cl.³ B65H *27/00*; G03B *1/04*; G11B *15/32*

U.S. Cl. 242—200 **10 Claims**



1. An apparatus suitable for use in removing or reducing a crease or tangle in a magnetic recording tape of a cassette, the cassette having a casing in which are two hubs carrying magnetic tape with a portion of the tape being exposed in an edge region of the cassette, each hub being arranged to rotate about a respective axis and the two axes being parallel to each other, the cassette being provided with two holes passing therethrough on said axes, the hubs having inwardly directed teeth which project into the respective holes, the teeth being used in driving the hubs to transfer the tape from one hub to the other, the apparatus comprising:

a holder capable of holding the cassette;

a rotatable shaft rotatably mounted with respect to the holder and having a working region in which are spaced apart teeth capable, in use, of engaging the teeth on one hub of the cassette when the cassette is correctly positioned in the holder;

rotating means capable of causing rotation of the shaft; and

a guide member which is capable of being positioned adjacent the cassette in the edge region of the latter where the tape is exposed, the guide member being provided with a slit through which the tape may be advanced when the one hub of the cassette is rotated;

the arrangement being such that, in use, with a cassette correctly positioned in the holder, with the guide member correctly positioned relative to the cassette, with the tape located in the slit of the guide member, and with the working region of the shaft engaging the teeth on the one hub, actuation of the rotating means causes the tape to be advanced through the slit thereby removing or reducing a crease or tangle in the tape.

4,390,147

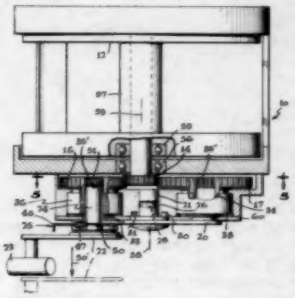
THREE SPEED DRIVE MECHANSIM FOR FISHING REEL

Stephen D. Zuckerman, 2444 Wilshire Blvd., #510, Santa Monica, Calif. 90403

Filed Aug. 24, 1981, Ser. No. 295,769

Int. Cl.³ A01K *89/00*

U.S. Cl. 242—215 **8 Claims**



1. A fishing reel adapted to be secured to a support comprising:

a frame including housing plates spaced apart substantially parallel to each other;

a spool shaft rotatably carried on said housing plates;

a gear housing mounted on one of said housing plates having a gear chamber provided therein adjacent to and closed by said one of said housing plates;

a pinion gear carried on said spool shaft within said gear chamber;

drive gears of different diameters rotatably mounted on said housing within said gear chamber and in constant mesh with said pinion gear;

crank handle means rotatably carried on said gear housing adapted to be alternatively and detachably coupled with a selected one of said drive gears to vary the speed of rotation of said shaft;

indexing means operably connected between said crank handle means and said housing for registering said crank handle means with said selected one of said drive gears; and

limiting means operably connected between said crank handle means and said housing for restricting the extent of crank handle means rotation with respect to said housing so as to align said crank handle means with said selected one of said drive gears.

4,390,148

ROTARY WING DEVICE

Patrick J. Cadmore, Duxbury, Mass., assignor to Wave-Rider, Inc., Duxbury, Mass.

Continuation of Ser. No. 672,513, Mar. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,835, Jun. 30, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 883,653

Int. Cl.³ B64C *39/00*

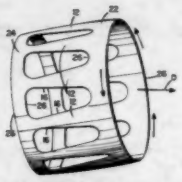
U.S. Cl. 244—19 **33 Claims**

23. An open-ended rotary wing device adapted to be rotated about its longitudinal axis and to be propelled forwardly relative to the surrounding fluid with its longitudinal axis having a small angle of attack relative to the forward flight direction in order to generate a biasing force on the device, the biasing force acting substantially perpendicularly to the longitudinal

axis and in the plane which includes both the longitudinal axis and the forward flight direction, said rotary wing device comprising:

(a) a plurality of longitudinally extending, laterally spaced-apart wing segments disposed in a hollow, open-ended, substantially cylindrical configuration, said wing segments being mounted for rotation about the longitudinal axis of said device;

(b) each said wing segment having a longitudinal dimension greater than its laterial dimension, each said wing segment having rounded streamlined lateral side edges, and each said wing segment being symmetrical in lateral cross-section wherein one side of said wing segment is the mirror image of the other side of the said wing segment;



(c) front and rear mounting rings provided on said device for rotatably mounting said wing segments, said front and rear mounting rings engaging and stabilizing the front tips and the rear tips, respectively, of said wing segments, said front mounting ring having a greater mass than said rear mounting ring; and

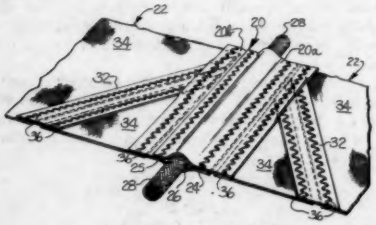
(d) the center of mass of said rotary wing device being located on the longitudinal axis of said device, said device being statically and dynamically balanced relative to the longitudinal axis of said device.

4,390,149

BALLOON ENVELOPE AND METHOD OF FABRICATING SAME

Tracy L. Barnes, and Christy A. Murphy, both of Statesville, N.C., assignors to The Balloon Works, Inc., Statesville, N.C.

Filed Apr. 29, 1981, Ser. No. 258,615
Int. Cl.³ B64B *1/40, 1/58*
U.S. Cl. 244—31 **9 Claims**



1. An inflatable envelope for a lighter than air balloon or the like, and characterized by the ability to limit distructive tearing thereof and comprising:

a latticework of interconnected tapes which collectively have a generally spherical configuration when extended, said latticework of tapes including a plurality of vertical tapes which divide the envelope into a plurality of vertically disposed gores, and

a plurality of laterally directed tapes which extend between the vertical tapes within each gore, said plurality of vertical tapes and laterally directed tapes collectively defining a plurality of open areas therebetween,

each of said vertical tapes being composed of a pair of like tape components having partially overlapping portions and adjacent non-overlapping portions, laterally spaced-apart seam means extending through said overlapping portion to interconnect the tape components and define a pocket therebetween and a load line extending freely through said pocket;

a plurality of panels of a relatively light weight, air impermeable sheet material, with each panel covering respective ones of said open areas, and,

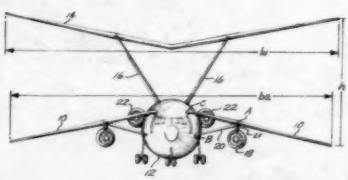
means joining each side of each panel to the non-overlapping portion of the adjacent tape component in a relatively airtight manner with the adjacent sides of adjacent panels being free of any direct interconnection between the adjacent panels and one of the pair of tape components whereby a tear developing in any one panel will terminate upon reaching an adjacent tape component without progressing into the adjacent panel and any torn panel can be removed and replaced without removing load line from its pocket.

4,390,150

TANDEM WING AIRPLANE

Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 648,706, Jan. 13, 1976, abandoned. This application Jan. 26, 1979, Ser. No. 6,698
The portion of the term of this patent subsequent to Jan. 14, 1989, has been disclaimed.
Int. Cl.³ B64B *3/00*
U.S. Cl. 244—45 R **7 Claims**



1. In a tandem wing aircraft having a fuselage structure and lifting surfaces, the improvement comprising in combination: a lower forward wing having an aspect ratio greater than 8 and a higher aft wing having an aspect ratio greater than 8, each of said wings adapted to provide lift ranging from 40% to 60% of the combined total lift supporting said aircraft in flight, said wings producing said lift and providing normal aircraft pitch control without production of a downwardly acting load; said lower forward wing being located adjacent to and attached directly to said fuselage structure in its forward region; said higher aft wing being aerodynamically spaced apart from and located above said fuselage structure in its aft region; said aft wing being attached to said fuselage structure by at least one aft strut member having a length sufficient to cause the wing tips of said forward and aft wings to be vertically spaced apart by at least 25% of the span of said forward wing and at least 25% of the span of said aft wing, each of said wing tips being free of connection to any other of said wing tips.

4,390,151

AIRCRAFT SKI MOUNTING ASSEMBLY

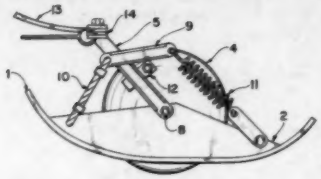
Richard J. Schneider, 20 Malaspina Dr., Eagle River, Ark. 99577

Filed Feb. 20, 1981, Ser. No. 236,205
Int. Cl.³ B64C *25/52*
U.S. Cl. 244—108 **4 Claims**

1. An aircraft ski mounting assembly for an aircraft landing gear comprising:

a. a ski having toe and heel portions, a bottom surface for contact with a landing surface and a pedestal integral with and protruding from the upper surface of the ski;

b. a ski attitude control arm pivotably attached to said pedestal on an axis transverse to the ski, said arm being operably biased into a generally upright position against a stop limiting the maximum distance between the upper end of the arm and the toe of the ski; and



c. a landing gear attachment means operably secured to said arm whereby the arm may be attached to the terminal end of an aircraft landing gear in a fixed relationship, the biased pivot between arm and ski pedestal thus acting to allow accomodation of the ski to limited changes of attitude between aircraft and landing surface without the ski toe dropping to dig into the landing surface.

4,390,152

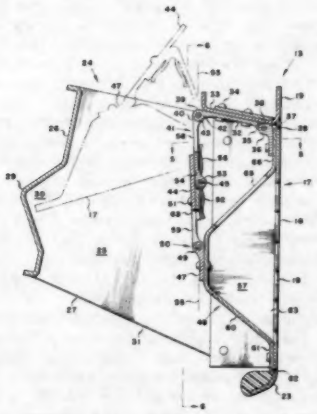
AIRCRAFT DECOMPRESSION VENT ASSEMBLY

Bernard A. Jorgensen, Chatsworth, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 13, 1976, Ser. No. 686,070

Int. Cl.³ B64D *25/00, 45/00*

U.S. Cl. 244—118.5 **21 Claims**



1. Apparatus for venting pressurized air through a hollow wall of a pressurized compartment of an aircraft, comprising:

a mounting structure;

an apertured return air grille hinged to said mounting structure for swinging movement from a first position in which a light flow of return air passes through the grille to a second more open position in which a greatly increased flow of vent air can enter the hollow wall past the grille, and

means forming a plenum chamber behind said grille into which said light flow of return air passes after flowing through the grille, said means including two swinging grille actuating plates forming a wall of said plenum chamber and hinges connecting said plates to the mounting structure and grille respectively at two spaced locations and to each other at an intermediate location, in a relation to swing said grille from said first position to said second position in response to a reduction in pressure at a downstream side of the plates;

there being a passage or passages through which said return air can discharge from said plenum chamber at a location downstream of the grille, so that said light flow of return air follows a path first through the grille, then through the plenum chamber, and then through said passage or passages into the interior of said hollow wall for discharge therefrom.

4,390,153

APPARATUS FOR SECURING A WING TO THE BODY OF A CRAFT

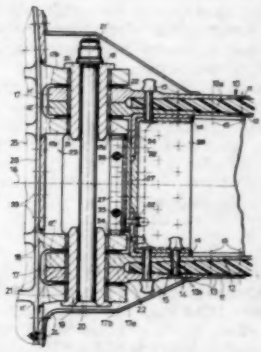
Matthias Wuermseer, Kirchseeon, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,667

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932667

Int. Cl.³ B64B *1/26*

U.S. Cl. 244—131 **7 Claims**



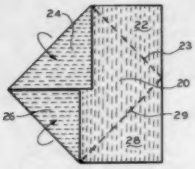
1. An apparatus for securing a fixed wing (**10**) having upper and lower fiber compound material planking means (**10***a*, **10***b*), to the body (**18**) of a craft, such as an aircraft, comprising upper and lower wing fork means each having a securing end (**11'**, **12'**) and two wing fork legs in the form of metal plates (**11**, **12**) forming a gap having surfaces with a tapering facing said wing planking means having a corresponding tapering facing the wing fork means, first means (**14**, **15**) operatively securing the metal plates of the wing fork legs (**11**, **12**) to the respective wing planking means (**10***a*, **10***b*), upper and lower forked body bracket means (**17**) arranged in pairs and rigidly secured to the body (**18**) of the craft, each of said body bracket means having forked bracket legs (**17***a*, **17***b*), said securing ends (**11'**, **12'**) of said wing fork metal plates (**11**, **12**) reaching into a space between said forked body bracket legs (**17***a*, **17***b*), second rigid securing means (**19**, **20**) extending through said body bracket means (**17**) and through the respective securing ends (**11'**, **12'**) of the corresponding wing fork means (**11**, **12**) whereby each of said first and second securing means is subject to shearing loads in two planes, wherein said wing (**10**) has a central plane extending substantially through the leading and trailing edge of the wing, and wherein said forked body bracket legs (**17***a*, **17***b*) of said upper and lower body bracket means (**17**) form four brackets (**17***a*, **17***b*) arranged so that two pairs of fork legs each are vertically aligned symmetrically above and below said central plane of the wing, whereby forces are uniformly and symmetrically introduced into the body and secondary bending of the wing structure and hence introduction of secondary bending moments into the body of the craft are avoided.

4,390,154

CORRUGATED PAPERBOARD PALLET DECK

Charles R. Ostler, and William A. Hampton, both of Anderson, Ind., assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 1, 1981, Ser. No. 307,370
Int. Cl.³ B65D *19/34*
U.S. Cl. 248—346 1 Claim



1. A paperboard pallet deck formed from a generally rectangular, unitary blank of corrugated paperboard which includes a layer of fluted medium having a flat, non-fluted layer of liner secured to at least one side thereof, said deck comprising:

(a) a generally rectangular main panel, located centrally of the blank with the side edges thereof disposed diagonally with respect to both the side edges of the blank and the flutes of the median layer;

(b) four generally triangular flaps located at the four corners of the blank and being foldably joined to the respective side edges of said main panel;

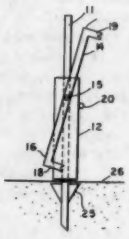
(c) said flaps each being folded inwardly 180° and secured in face-to-face relation with adjacent portions of said main panel and with their flutes extending in a direction normal to that of the main panel flutes.

4,390,155

GARBAGE CAN AND LID HOLDER

Howard Weldon, Sanford Rd., West Springfield, Pa. 16443, and James Stoker, 11763 Ridge Rd., East Springfield, Pa. 16411

Filed Nov. 17, 1980, Ser. No. 207,137
Int. Cl.³ A47B *97/00*
U.S. Cl. 248—507 1 Claim



1. A can holder for a container comprising:

a post adapted to be inserted into the ground, a weight slidably supported on the post for vertical movement thereon,

a pivot means on said weight,

a lever having a first end and a second end and an intermediate part,

said pivot means engaging said intermediate part,

and means on the first end to engage the lid of a first garbage can and means on said second end for engaging the lid of a second garbage can whereby said pivot means slidably supports said lever on said weight,

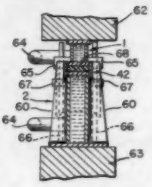
and a stop (20) attached to the weight to engage the lever at a position spaced from the pivot (15).

4,390,156

FABRICATED SHEET METAL COMPRESSION MOLD AND METHOD OF MAKING

Leonard S. Meyer, Columbia, S.C.; Michael J. Murray, Orange Lake, Fla.; Gerald G. Hayes, and Robert L. McClain, both of Gainesville, Fla., assignors to Victor United, Inc., Chicago, Ill.

Filed Jan. 23, 1981, Ser. No. 228,703
Int. Cl.³ B29C *1/02*
U.S. Cl. 249—80 3 Claims



1. A compression mold apparatus comprising a plurality of individual sheet metal mold components initially individually fabricated and subsequently assembled to provide two separate cooperating elements for producing elongated compound curved articles therebetween from reinforced plastics compositions including, a punch element having a planar base plate provided with opposite first and second surfaces bounded by longitudinally extending lateral edges, a pair of substantially congruent longitudinal side plates having opposite planar and contoured edges and opposite inner and outer faces, said side plates affixed to said base plate with said planar edges abutting said first surface and said side plates laterally spaced apart to define a fluid-receiving chamber between opposed said inner faces of said plates, a forming plate including lateral edges at least partially laterally contoured to provide a variation in the width thereof and provided with an undersurface spanning said pair of side plate contoured edges and affixed thereto, said forming plate vertically curved to conform to the curvature of said side plate contoured edges, end plates affixed to opposite portions of said side, base and forming plates and enclosing said chamber in a fluid-tight manner, a cavity element having a planar base plate provided with opposite first and second surfaces bounded by longitudinally extending lateral edges, a pair of substantially congruent longitudinal support plates having opposite planar and contoured edges and opposite inner and outer faces, said support plates affixed to said base plate with said support plate planar edges abutting said cavity base plate first surface with said support plates laterally spaced apart to define a fluid-receiving chamber between opposed said inner faces of said support plates, a mold cavity plate including lateral edges at least partially laterally contoured to provide a variation in the width thereof and provided with an undersurface spanning said pair of support plate contoured edges and affixed thereto, said cavity plate vertically curved to conform to the curvature of said support plate contoured edges and the curvature of said punch forming plate, vertical side cavity plates having inner walls affixed to said cavity plate lateral edges and defining a mold cavity therebetween, end plates affixed to opposite portions of said cavity element support, base and mold cavity plates to enclose said cavity element chamber in a fluid-tight manner, said punch element forming plate lateral edges providing a close sliding fit between said side cavity plates throughout the longitudinal extent of said mold cavity, inlet and outlet means communicating with both said punch and cavity element chambers and adapted to transmit fluid through both said chambers to regulate the temperature of said punch and cavity elements and cooperating guide means on said punch and cavity elements insuring alignment during opening and closing of said cooperating punch and cavity elements.

4,390,157

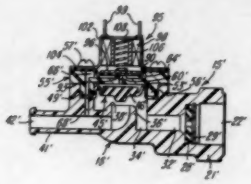
PILOT OPERATED FLUID CONTROL VALVE

Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409

Continuation-in-part of Ser. No. 11,227, Feb. 12, 1979, Pat. No. 4,248,402. This application Feb. 2, 1981, Ser. No. 230,441

Int. Cl.³ F16K *31/40*

U.S. Cl. 251—30 4 Claims



1. A pilot operated liquid control valve comprising a valve body including a base section and a closure section, said base section having means defining an inlet and an outlet with a valve seat therebetween, a first flexible diaphragm having an outer portion clamped between said base and closure sections of said valve body and a movable inner portion cooperating with said seat to control the flow of liquid from said inlet to said outlet, means defining a bleed hole for directing a limited flow of liquid from an inlet chamber on one side of said first diaphragm to a second chamber on the other side of said first diaphragm, said base and closure sections defining a vent passage for directing liquid from said second chamber around at least said inner portion of said first diaphragm to said outlet and providing for the release of liquid flowing through said bleed hole, a liquid impervious second flexible disphragm having an outer portion secured to said closure section and an inner portion flexible between an open position permitting the flow of liquid through said vent passage from said second chamber and a closed position blocking the flow of liquid through said vent passage, means for sealing said outer portion of said second diaphragm to said closure section to prevent the liquid within said vent passage from contacting the outer surface of said second diaphragm, an electrically operated solenoid having a disc-like armature disposed adjacent said outer surface of said second diaphragm, spring means associated with said armature for urging said inner portion of said second diaphragm towards said closed position, and means for energizing said solenoid to effect movement of said armature and said inner portion of said second diaphragm to said open position.

4,390,158

ELECTRO HYDRAULIC SERVO VALVE

Armin Lang, Schwaebisch Gmuend, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

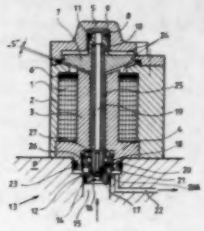
Filed Oct. 14, 1980, Ser. No. 196,827

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942886

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—129 5 Claims

1. In a solenoid operated valve assembly including an inlet (15), an outlet (22), a solenoid (1), a magnetic core (3) having opposite end faces, an armature (7) disposed adjacent to one of said end faces, an operating element (10) connected to the armature and having opposite end portions, a piston (8) connected to the operating element at one of said end portions thereof, valve means (13) including a valve seat (12) and a valve head (14) connected to the other of the end portions of the operating element and housing means (2, 5) having a pressure chamber (9), said piston being exposed to pressure in the pressure chamber exerting a valve closing force on said valve means through the operating element; said valve means being closed when said solenoid is energized thereby cutting off flow between said inlet and outlet; the improvement comprising: passage means (18, 19,20) for establishing fluid communication between said outlet (22) and said pressure chamber (9) whereby outlet pressure in said chamber acts to close said valve means, said passage means having a bore (19) extending through said operating element, said valve head (14) being formed on said operating element at said other of the end



portions thereof, said bore extending through the armature and opening directly into said pressure chamber, said magnetic core extending through said solenoid; said operating element extending axially completely through the magnetic core; said armature being disposed externally of said magnetic core adjacent said one of the end faces thereof and said valve head being disposed beyond the other of the end faces of said magnetic core.

4,390,159

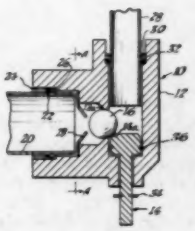
SNAP-ON SHUT OFF VALVE

Ronnie J. Duncan, 219 Lake Arbor, Palm Springs, Fla. 33461

Filed Apr. 27, 1981, Ser. No. 257,753

Int. Cl.³ F16K *51/00*; F16L *19/00*

U.S. Cl. 251—148 1 Claim



1. A fluid shut-off snap-on valve that can be fabricated at low cost and is readily installed in a fluid supply line comprising:

a rigid housing, said housing having a first chamber and a second chamber, and a passage disposed between said first chamber and said second chamber allowing fluid communication therebetween;

a valve member positionable within said housing passage;

means for retaining said valve member in said housing passage disposed in said housing passage;

a valve seat forming an opening between said passage and said second chamber, said valve member being engageable with said valve seat to seal said inlet passage;

means coupled through said housing for moving said valve member between a first position and a second position in said passage, said first and second positions defining closed and open positions of said valve, respectively, whereby inlet water pressure acts to force said valve member against said valve seat to said first position; and

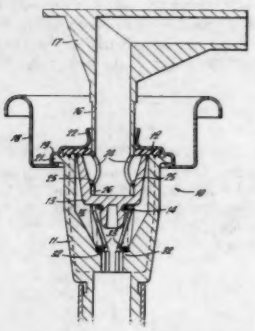
spiral-shaped means coupled in said first and second chambers for retaining a pipe end to prevent dislodging of said pipe end, once it is positioned within said first and second chamber said retaining means further including spiral-shaped retaining member having an outside diameter substantially equal to said inlet and outlet chambers, said spiral-shaped member having an internal aperture, the diameter of which is slightly smaller than the outside diameter of the pipe end to be connected, said retaining member having at least one radial slot along the inner portion of said aperture, said slot forming deformable segments for interlocking said pipe end to said valve housing.

4,390,160

VALVES FOR PRESSURIZED DISPENSING CONTAINERS

Norman L. Reed, The Wickets, Walnut Ave., West Winch, King's Lynn, Norfolk, England

Filed Jul. 2, 1980, Ser. No. 165,475
Int. Cl.³ B65D *83/00*
U.S. Cl. 251—149.6 **6 Claims**



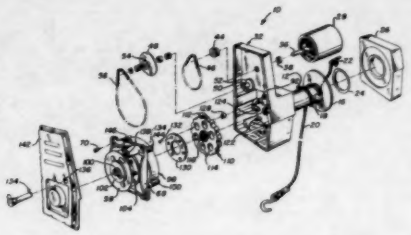
1. A valve for a pressurized dispensing container and comprising a valve housing defining a valve chamber and having at its lower end an inlet for pressurized material, an annular flexible seal clamped into position closing the upper end of the chamber, a cup-shaped valve member within the chamber, a hollow actuator stem extending in sliding, sealed relation through the seal and engaging the valve member at its lower end, and a spring urging the valve member upwardly into sealing engagement with the seal, the actuator stem being manually moveable downwardly against the action of the spring to unseat the valve member and open the valve, in which the wall of the actuator stem includes at least one radial aperture adjacent to but spaced from the lower end of the actuator stem and of a height dimension sufficiently greater than the thickness of said flexible seal that a substantial portion of a entire peripheral segment of the inner annulus of said flexible seal is not in contact with an outer surface of said stem and can expand to protrude inwardly of said aperture when said aperture and seal are in the same plane, thereby defining a lip extending along the lower portion of said aperture against which said flexible seal non-stem contacting segment is engageable upon withdrawal of said actuator stem from engagement with said valve member, the aperture placing the interior of the actuator stem in communication with the interior of the valve member and the lip portion serving to restrain the lower end of actuator stem from passing through the seal if the actuator stem is moved upwardly of the seal.

4,390,161

WINCH DRIVE AND BRAKE MECHANISM

Robert G. Nelson, Thompson, Conn., assignor to Superwinch, Inc., Putnam, Conn.

Filed Mar. 3, 1981, Ser. No. 240,096
Int. Cl.³ B66D *1/00*
U.S. Cl. 254—356 **17 Claims**



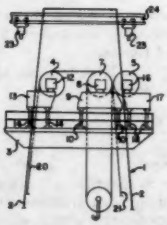
1. A winch drive and brake mechanism comprising a stationary frame, a fixed member rigidly secured to the fixed frame against both axial and angular movement relative to the stationary frame, a rotary cable drum supported on the frame for rotation, a power operated rotary drive shaft coaxially aligned with the drum and supported by the fixed member for rotary movement, a rotary speed reducer drivingly connecting the cable drum and drive shaft for rotation respectively in opposite angular directions, a first rotary brake member coaxially fixed to the drive shaft for rotation, a second rotary brake member coaxially mounted on the drive shaft between the first brake member and said fixed member, the second brake member being freely supported for rotation on the drive shaft and for movement axially of the drive shaft, the first brake member being engageable with the second brake member for axially moving it toward the fixed member into brake engaged position and releasing the second brake member for movement axially away from the fixed member toward a brake released position responsive respectively to rotation of the first brake member relative to the second brake member in opposite angular directions.

4,390,162

INFINITELY VARIABLE CROWN BLOCK POSITIONING

Joseph R. Woolslayer, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed May 20, 1981, Ser. No. 265,438
Int. Cl.³ B66D *1/82*
U.S. Cl. 254—398 **6 Claims**



1. In an oil well drilling derrick, parallel horizontal crown beams mounted in the upper part of the derrick and having end portions projecting beyond its opposite sides, a fast line sheave near one side of the derrick and a dead line sheave near the opposite side, means supporting the sheaves on said beams with their axes of rotation extending transversely of the beams for selective adjustment lengthwise of the beams to respective

inactive positions on the projecting end portions and to active positions inboard, and a crown block mounted on the beams between said sheaves with its axis of rotation extending transversely of the beams, means supporting the crown block on said beams for adjustable movement therealong between the opposite sides of the derrick.

4,390,163

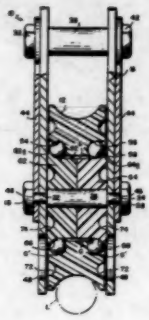
MARINE BLOCK

Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

Continuation of Ser. No. 297,227, Aug. 28, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 387,952

Int. Cl.³ B66D *1/36*

U.S. Cl. 254—412 **7 Claims**



1. A marine block comprising

A. a pair of similar cheek plates,

B. first and second spacer means for maintaining the cheek plates in parallel, spaced-apart relation,

C. a sheave,

D. bearing means for rotatively mounting the sheave on said first spacer means

(1) said bearing means including at least one spaced-apart circular race, and

(2) a circular array of bearing elements engaged in each race, and

E. means defining relatively large ports in said cheek plates directly opposite the bearing means so that water streams can be directed through said ports from opposite sides of the block so as to scrub the surfaces of the bearing elements and the race free of film and dirt.

4,390,164

PRESS LOCK SYSTEM FOR RAILING CONSTRUCTION

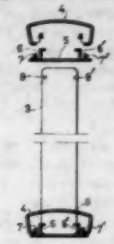
Erden Cokelekoglu, 3685 County Rd. #42, Windsor, Ontario, Canada (N9A 6J3)

Filed Sep. 23, 1981, Ser. No. 305,026

Int. Cl.³ E04H *17/14*

U.S. Cl. 256—65 **2 Claims**

1. The construction of railing for use on balconies and other similar installations, by means of components which snap and hold together by the application of pressure, comprising a handrail which consists of a slightly convex handrail cover, of a width to provide a hand grip, the ends of said cover being bent downwardly and at a small angle inwardly, into two opposite handrail walls, which are further bent inwardly into short horizontal bends; a handrail base which attaches to said handrail cover, consisting of a flat plate, a pair of short, vertical, cover-holding hooks attached to the upper face of said plate, facing away from each other, and each hook being located near each of the sides of said baseplate; a pair of spaced, vertical, inwardly facing hooks also attached to the upper face of said base plate, located symmetrically between the said cover-holding hooks, and extending slightly above them; a plurality of uniformly spaced holes provided in said baseplate for the passage therethrough of the upper end of each baluster; a footrail constructed substantially the same as the said handrail, with the exception that the baluster penetration holes are



provided in the cover plate instead of the baseplate; and a plurality of vertical balusters, each having two opposite flat walls, provided with horizontal channels into which hook the baluster hooks of the baseplate.

4,390,165

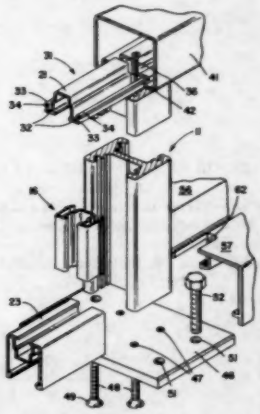
DECORATIVE GLASS PANEL RAILING ASSEMBLY

Robert H. Murdock, Kensington, Calif., assignor to NEF Systems, Inc., Oakland, Calif.

Filed Nov. 24, 1980, Ser. No. 209,991

Int. Cl.³ E04H *17/14, 17/16*

U.S. Cl. 256—24 **19 Claims**



1. A decorative glass panel railing assembly, comprising; a plurality of upwardly extending line posts disposed in generally parallel, spaced apart configuration, each of said posts including a pair of post channels extending longitudinally and disposed on opposed sides of said post; anchor means for securing said posts to the floor; a plurality of glazing inserts, each adapted to be received in one of said post channels, each glazing insert including a channel-like cavity therein and cushioning means disposed in said channel-like cavity to engage a vertical edge portion of a glass panel; detent means for retaining said glazing inserts in said post channels; first means for supporting a lower horizontal edge portion of a glass panel; second means for supporting an upper horizontal edge portion of a glass panel; and top rail means secured to said second means.

4,390,166

HOT-GUNNING METHOD FOR REPAIRING CONVERTERS

Hiroyuki Danjo; Kazuaki Takimoto, both of Okayama; Gensuke Muta, and Nobuyoshi Hiroki, both of Ibaraki, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo and Sumitomo Metal Industries Co., Ltd., Osaka, both of, Japan

Continuation-in-part of Ser. No. 39,824, May 17, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 188,867
Claims priority, application Japan, May 29, 1978, 53/64031
Int. Cl.³ C21C 5/44; C04B 35/04
U.S. Cl. 266—44 6 Claims

1. A hot-gunning method for repairing a converter lined with bricks which comprises the steps of:

providing a composition comprising:

(a) 8–15% by weight of water;

(b) 20–40% by weight of a pellet prepared by mixing 40–60% by weight of magnesia type refractory powder containing more than 75% by weight of MgO and having a particle size of not more than 1 mm with 60–40% by weight of molten tar and dropping the resulting mixture into water or cooled air; and

(c) the substantial balance of said composition comprising a refractory material selected from the group consisting of magnesia clinker, dolomite clinker, chrome ore and mixtures thereof, and a binder; and

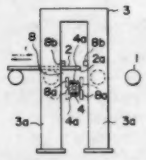
gunning said composition onto the lining of said converter at a high temperature.

4,390,167

APPARATUS FOR REMOVING TORCH-CUTTING SLAG OF SLAB

Susumu Ito; Sadayuki Saito, both of Chiba, and Kazuya Higuchi, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Dec. 29, 1981, Ser. No. 335,716
Int. Cl.³ B23K 7/02
U.S. Cl. 266—48 4 Claims



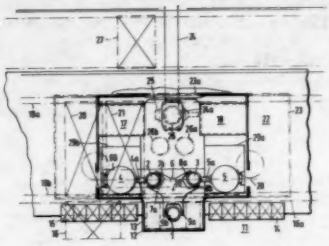
1. Apparatus for removing a torch-cutting slag of a slab, wherein in cutting tool mount vertically and rotatably controllable is transversely racked beneath a space formed between rollers disposed at desirable positions of a conveying roller table for conveying the slab fusion-cut to a predetermined length in a direction perpendicular to the conveying roller table, and cutting tools for cutting and removing the torch-cutting slag of the slab are provided at least at positions symmetrical with each other along the longitudinal outer surfaces of the cutting tool mount.

4,390,168

CRANE AND HOIST FOR STEEL MANUFACTURING MILL

Johannes Müller, Dusseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengeselischaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,587
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044258
Int. Cl.³ C21C 5/52
U.S. Cl. 266—142 2 Claims



1. In a steel manufacturing mill comprising:

(a) a furnace hall area having at least one first movable hoisting crane riding on a first trolley;

(b) a transferral hall area separate from said furnace hall area;

(c) said transferral hall area being provided with a second movable hoisting crane riding on a second trolley;

(d) two or more smelting furnaces located in said furnace hall area;

(e) each of said furnaces being provided with a tap hole;

(f) the tap holes of said furnaces facing one another;

(g) a rotatable, turntable-type element located between said furnaces proximal to said tap holes;

(h) a plurality of casting ladles rotatively supported by said turntable-type element;

(i) said turntable-type element serving to selectively rotate said individual casting ladles from a first position proximal to one of said tap holes to a second position within said transferral hall area proximal to said second movable hoisting crane; the improvement characterized by

(j) said first movable hoisting crane riding on said first trolley being provided with a hoisting means which is stationary with respect to said first trolley yet movable with respect to said furnaces by moving with said first trolley; and

(k) the longitudinal axis of said hoisting means being in a vertical plane extending through the centers of said smelting furnaces.

4,390,169

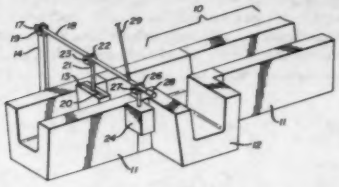
MODULAR UNIT BLAST FURNACE RUNNER AND HOT METAL GATE

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Feb. 17, 1981, Ser. No. 234,648
Int. Cl.³ C21B 7/14
U.S. Cl. 266—196 6 Claims

1. The combination of a modular unit blast furnace runner and a gate for movement into and out of said runner, said gate

being of a shape and size conforming with said runner, said gate being formed of a refractory base material, elongated



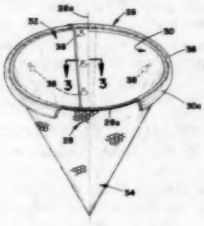
resilient stainless steel needles embedded in said refractory base material for flexibly reinforcing said gate.

4,390,170

CLOSURE PLUG FOR LADLE CAR

Louis B. Schaefer, IV, 810 Beechwood Dr., Medina, Ohio 44256, and Thomas M. Miller, 26027 Byron Dr., North Olmsted, Ohio 44070

Filed Mar. 19, 1982, Ser. No. 359,774
Int. Cl.³ C21C *5/46*
U.S. Cl. 266—272 **20 Claims**



1. A closure plug for a ladle car container having an opening thereinto through which molten metal is poured into and from the container and which container opening has an axially outer end and a peripheral edge at said outer end, said closure plug having an axis and including wall means providing said plug with an open axially outer end and a closed axially inner end, said wall means comprising lining means of fibrous insulating material and flexible support means for lining said means, said support means being open mesh screen means, said plug being received in and closing said container opening with said closed inner end spaced axially inwardly of said peripheral edge of said opening.

4,390,171

COMPRESSION SPRING CAPSULE

Bernard H. Geisow, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

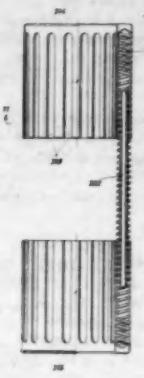
Division of Ser. No. 963,459, Nov. 24, 1978, Pat. No. 4,331,315.
This application Oct. 28, 1981, Ser. No. 315,710
Int. Cl.³ F16F *3/04*
U.S. Cl. 267—169 **3 Claims**

1. A compression spring capsule comprising:

a pair of generally cylindrical tubular spring retainer bodies, each being formed to define a plurality of elongated cylindrical blind spring retainer recesses being oriented in generally parallel relation and substantially parallel to the elongated axis of said spring retainer bodies;

a plurality of helical compression springs being provided having the extremities thereof positioned within said spring retainer recesses in each of said pair of spring retainer bodies and spacing said bodies a first distance from each other when in an uncompressed state; and

inner support rods being loosely positioned within each of said plurality of compression springs with the extremities thereof receivable within said opposed spring retainer recesses, the length of each of said inner support rods exceeding said first



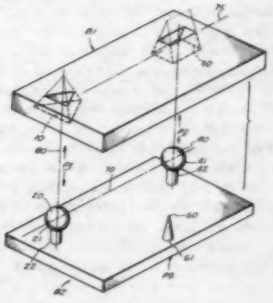
distance of said spring retainer bodies and being less than the combined length of said spring retainer recesses when said spring retainer bodies are disposed in abutment.

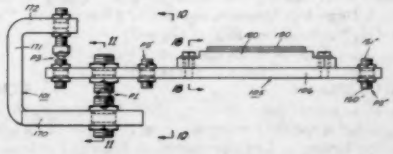
4,390,172

PRECISE QUICK-RELEASE POSITIONING MECHANISM

Alexander Gotman, Santa Monica, Calif., assignor to Presco, Inc., Irvine, Calif.

Filed Nov. 28, 1980, Ser. No. 211,105
Int. Cl.³ B23Q *1/06*
U.S. Cl. 269—56 **14 Claims**





1. A system for removably securing two rigid bodies together at three support points in a fixed and predetermined spatial relationship so that they can be quickly and easily separated and then secured together again in precisely the original relationship, said system comprising:

a first body having first and second exposed openings, said first opening being in the form of a trihedral pyramid with its widest dimension at the outward end, and said second opening being in the form of dihedral prism with its widest dimension at the outward end;

said dihedral prism of said second opening having a longitudinal axis which extends toward said first opening;

said first body also having an exposed supporting surface which lies outside an axis common to said first and second openings;

a second body having first and second protruding hemispheres which are so spaced as to be received by said first and second openings, respectively, of said first body; and

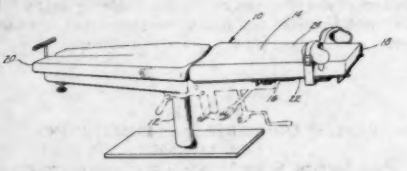
said second body also having a protrusion adapted to engage said exposed surface of said first body.

4,390,173

ADJUSTABLE ANKLE STIRRUP DEVICE FOR A CHIROPRACTIC TABLE

James E. Barnes, Fort Wayne, Ind., assignor to James M. Cox, Spencerville, Ind., a part interest

Filed Jul. 27, 1981, Ser. No. 287,413
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 **6 Claims**



1. Chiropractic table apparatus comprising a table having top and bottom surfaces, side edges and a foot portion, a bar fixedly supported on said table to extend longitudinally thereof in spaced parallelism with said bottom surface,

a stirrup bracket having two angularly related legs with the end portion of one leg being slidably mounted on said bar and the other leg being adapted to extend upright along one end of said table, and means for disengageably supporting said bracket at a selected position longitudinally of the table with said other leg upright and for restraining movement of said bracket in a direction away from said foot portion while in said position, said means including a hook element on said table and extending beneath said bottom surface to be disposed in registry with said one leg of said bracket, said hook element having an open portion extending substantially parallel to said bar and adapted to disengageably receive said one leg in supporting relation.

4,390,174

CONTROL HEAD FOR CONTROLLING THE SUCTION PATH OF A SUCTION ROLLER

Dieter Veith, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co., Neuwied, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 244,835
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—108 **5 Claims**

1. In a control head for controlling the suction path of a suction roller and the feeding of sheets, cut paper or the like, of the type having at least one suction conduit and at least one fresh air conduit both opening onto one side of said control head which is stationarily disposable adjacent to a rotatable suction roller having suction holes formed therein which discharge into a supply bore which, depending on the rotatable position of said suction roller, may communicate with said suction conduit or said fresh air conduit and, in turn, a vacuum source or the atmosphere, respectively, the improvement comprising:

said fresh air conduit having a leading control edge which communicates with a venting conduit opening onto said surface of said control head and positioned generally between said suction and fresh air conducts which venting conduit is so dimensioned and shaped that, during initial communication of said supply bore with said fresh air

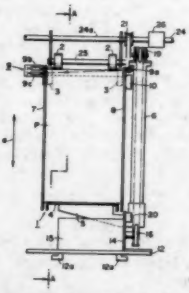
conduit, only a small free cross-sectional opening provided by said conduit is available for establishing communication between said fresh air conduit and said supply bore, so as to permit a gradual venting of said supply bore, which opening gradually increases and finally equals the full cross-sectional diameter of said fresh air conduit, when said fresh air conduit and said supply bore are in complete alignment with one another.

4,390,175

RECORDING MEDIUM FEEDING DEVICE

Yuji Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,097
Claims priority, application Japan, Feb. 18, 1980, 55-18823
Int. Cl.³ B65H *1/18*
U.S. Cl. 271—157 **8 Claims**



1. A recording medium feeding device usable with an image formation apparatus, comprising:

a recording medium stacking table;

feed means for feeding recording mediums from said stacking table;

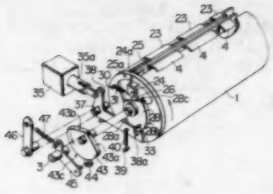
drive means for raising and lowering said stacking table between a feeding position and a lower limit position; and

control means for controlling said drive means to lower said table to a stand-by position between its feeding position and its lower limit position in response to a first signal indicating that a supply of recording mediums is required on said stacking table, and to raise said stacking table to its feeding position in response to a second signal indicating that said stacking table is supplied with recording mediums.

4,390,176
SHEET CLAMPING DEVICE

Toshifumi Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 23, 1980, Ser. No. 199,955
Claims priority, application Japan, Oct. 24, 1979, 54-137427
Int. Cl.³ B65H 5/12, 5/14
U.S. Cl. 271—270 31 Claims

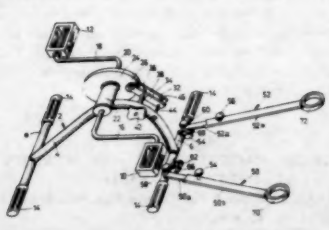


1. A sheet clamping device comprising a drum around which a sheet is to be disposed, drum drive means for driving the drum for rotation in a given direction, first swingable clamping means extending outwardly of the drum through a slit formed in the drum along a generatrix thereof and being swingable between an open and a closed position relative to the drum surface for clamping the leading end of a sheet against the drum surface, operating means for selectively driving the clamping means to its open or closed position, second swingable clamping means extending outwardly of the drum through the slit formed in the drum and swingable between an open and closed position relative to the drum surface for clamping the trailing end of the sheet against the drum surface, second operating means for selectively driving the second clamping means to its open or closed position, and sheet combing means movable toward or away from the drum surface for urging the sheet against the drum surface as the sheet is being disposed around the drum, in which the drum is associated with directing means for detecting the rotational position of the durm, and brake means for applying a braking effort to the drum as it rotates, and wherein the first clamping means is adapted to be brought to a stop at a third location which is lagging behind a first location where a sheet clamping operation for the leading end of the sheet is initiated and which leads a second location where a sheet clamping operation for the leading end of the sheet is completed.

4,390,177
FOOT-OPERATED EXERCISING DEVICE

Benjamin Biran, and Miriam Biran, both of David Pinski St. 25, Haifa, Israel

Filed Jan. 27, 1981, Ser. No. 228,760
Claims priority, application Israel, Feb. 3, 1980, 59291
Int. Cl.³ A63B 23/04
U.S. Cl. 272—73 9 Claims

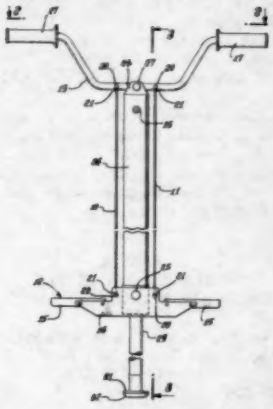


1. A foot-operated exercising device including a frame having a longitudinally-extending frame bar terminating at its opposite ends in a pair of transversely-extending frame legs for supporting the frame bar on a horizontal surface during use of the device, and a pair of foot pedals rotatably mounted on the frame bar about a horizontal, transversely-extending axis; characterized in that said device further includes a pair of variable-length arms pivotably mounted to one of said transversely-extending frame legs, each of said arms being pivotable about a respective vertical axis to said one frame leg such that said arms may be pivoted to an operable position behind said one frame leg on the side thereof opposite to the other frame leg or to a non-operable position in folded relationship with respect to said frame legs; each of said arms including means at the ends thereof for anchoring same by an external device.

4,390,178
PIVOTAL JUMPING STICK

Elliot Rudell, 5319 W. 146th St., Lawndale, Calif. 90260; Joseph Cernansky, and Harold Garner, both of Los Angeles County, Calif., assignors to Elliot Rudell, Lawndale, Calif.

Continuation of Ser. No. 161,265, Jun. 20, 1980, abandoned.
This application May 25, 1982, Ser. No. 381,838
Int. Cl.³ A63B 25/08
U.S. Cl. 272—114 4 Claims



1. A jumping stick mechanism for use by a rider, including an exterior tube having an upper end and a lower end, foot means connected to the lower end of said exterior tube, impacting means slidably mounted within said exterior tube and projecting from said lower end adjacent to said foot means, spring means within said exterior tube abutting said impacting means, and handle means comprising handlebars attached to the upper end of said tube, and wherein the improvements comprise:

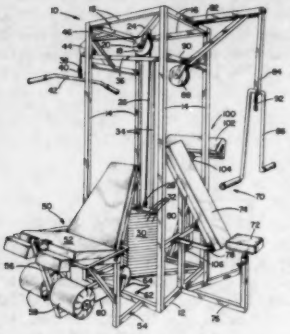
said foot means being pivotably mounted to said exterior tube whereby the rider can alter the angle of incidence of said foot means to said exterior tube in order to facilitate the rider shifting his body weight and position to achieve a different center of gravity to maintain balance and control of the jumping stick on uneven terrain,

said handle means being pivotably mounted to said exterior tube whereby the rider can alter the angle of incidence of said handle means to said exterior tube in order to facilitate the rider shifting his body weight and position to achieve a different center of gravity to maintain balance and control of the jumping stick on uneven terrain.

4,390,179
MULTI-STATION EXERCISING APPARATUS

Kalman Z. Szkalak, 7631 Yukon Dr., Huntington Beach, Calif. 92648

Filed Jul. 1, 1981, Ser. No. 279,530
Int. Cl.³ A63B 21/06
U.S. Cl. 272—118 12 Claims



1. Apparatus for the stationing of multiple exercising machines of the type employing a pulley and cable system to lift a weight, said apparatus comprising:

a plurality of attachable exercising machines spaced apart from each other around the periphery of the apparatus;

a structural framework adapted for the attachment of said exercising machines thereto;

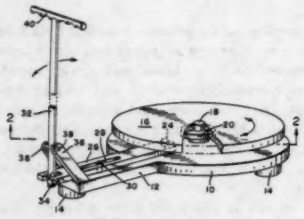
means on said framework adapted for the attachment of at least one fixed pulley for each of said machines; and

central pulley means pivotally mounted centrally on said framework, said central pulley means pivotable successively from one machine to another for operative connection to each of said fixed pulleys.

4,390,180
EXERCISE APPARATUS

Luther G. Simjian, 1750 S. Ocean Ln., Fort Lauderdale, Fla. 33316

Division of Ser. No. 196,849, Oct. 14, 1980, Pat. No. 4,313,603. This application Oct. 23, 1981, Ser. No. 314,172
Int. Cl.³ A63B 23/02
U.S. Cl. 272—126 3 Claims



1. An exercise apparatus comprising:

a stationary support;

a turntable platform mounted upon said support for oscillating rotating motion about a centrally disposed axis of said platform and adapted to support a person in standing position;

a substantially vertically disposed post mounted forward of the perimeter of said platform and supported by said support for rotating motion about the substantially vertical axis passing through said post;

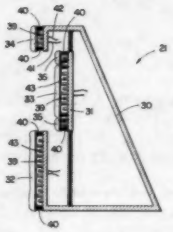
a substantially horizontally disposed handle bar affixed to the upper end of said post, and

drive means coupled between said platform and said post for causing responsive to said oscillating rotating motion of said platform said post to be driven in an oscillating rotating motion about its substantially vertical axis, whereby to cause pivotal motion of said handle bar in a substantially horizontal plane about the axis of said post.

4,390,181
PRACTICE PITCHING APPARATUS

Max M. Parish, P.O. Box 86, French Lick, Ind. 47432

Filed Apr. 8, 1980, Ser. No. 138,295
Int. Cl.³ A63B 69/40
U.S. Cl. 273—26 A 2 Claims



1. A practice pitching apparatus which maintains a count of balls, strikes and outs comprises:

an upright target member having a front surface arranged into a strike zone and a surrounding ball zone, said target member including a supporting frame, a plurality of spring-biased impact panels, and a plurality of switches supported by said frame and disposed directly behind said impact panels, said plurality of spring-biased impact panels including a first panel arranged to provide said strike zone and a second series of panels arranged to provide said surrounding ball zone;

a strike-counting circuit section responsive to ball impact on said first panel;

an out-counting circuit section coupled to and cooperatively arranged with said strike-counting circuit section;

a ball-counting circuit section responsive to ball impact on said second series of panels;

display means for indicating the number of strikes and the number of balls thrown;

said plurality of switches including a first group arranged in parallel and comprising a portion of said strike-counting circuit section and a second group arranged in parallel and comprising a portion of said ball-counting circuit section; and

said first group of switches is subdivided into a first subgroup of switches arranged behind said strike zone panel and a second subgroup of switches arranged behind said ball zone panels, said first subgroup operatively arranged to energize said strike-counting circuit section, said second subgroup operatively arranged to disable said strike-counting circuit section.

4,390,182
REINFORCED RACKET FRAME AND METHOD OF PRODUCING SAME

Chin-San You, No. 3, Lane 1029, Fong-Shih Rd., Weng-Tzu Li, Fong Yuan City, Taiwan

Filed Jun. 8, 1981, Ser. No. 271,131
Int. Cl.³ A63B 49/02
U.S. Cl. 273—73 C 6 Claims

3. A racket frame, comprising:

a plurality of elongate wooden strips laminated and fabricated to form a frame shape;

a groove formed in the mid part of said strips and extending longitudinally therethrough perpendicularly to the string plane of the racket, the groove having a cross section narrow at the center and wider at the ends;

a reinforcing material in said groove extending longitudinally along the full length of said groove and substantially filling all of said groove, said reinforcing material comprising means for improving the strength of said frame shape relative to bending moment, whereby the shape of the groove bonds the reinforcing material to the wood.

4,390,183

SMALL-SIZE DEVICE FOR SIMULATING A BRIDGE GAME

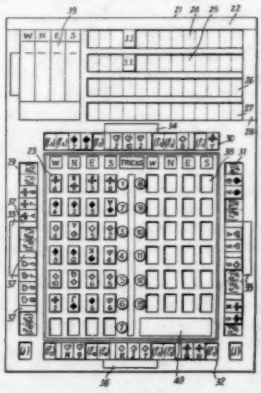
Catherine Gedon, 17 rue de Sevres, 92100 Boulogne Billancourt, France

Filed Nov. 23, 1981, Ser. No. 324,176

Claims priority, application France, Nov. 24, 1980, 80 24898

Int. Cl.³ A63F *1/00*

U.S. Cl. 273—148 A **8 Claims**



1. A small-size device for simulating a bridge game, which comprises:

a small board,

means defining a first series of 52 cavities provided in said board, said first series of cavities being disposed according to four rows of thirteen cavities each, these rows being parallel to each other and in close relationship,

means defining a second series of 52 cavities provided in said board, said second series of cavities comprising four rows of thirteen cavities each disposed along the outer periphery of a substantially square game area,

a third series of 52 cavities provided in said board, said third series being disposed inside said square game area and comprising thirteen rows of four cavities each,

and 52 blocks bearing the pictures of the various symbols of bridge playing cards, each one of said blocks having a prismatic configuration and being adapted to be partially embedded into any cavity of said first to third series of cavities,

so that in said first defined series of cavities said blocks can be disposed according to their suits in a storage position, while in said second defined series of cavities said blocks can be disposed to display the four hands of any bridge deal and in said third series of cavities said blocks can be disposed to represent the thirteen tricks as they are accomplished.

4,390,184

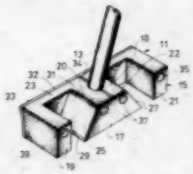
GOLF PUTTER HEAD AND PUTTER INCORPORATING SUCH HEAD

David C. Rudell, 362 South Creek Dr., Depew, N.Y. 14043

Filed Sep. 16, 1981, Ser. No. 302,529

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—183 D **14 Claims**



1. A golf putter comprising a handle, a head and a shaft connecting said handle and head, with the putter head having a leading side portion with a substantially vertical leading surface for putting a golf ball and three separate trailing portions extending backwardly from the leading side portion, two of which extend from end portions of the leading side portion of the putter and the third of which extends from a middle portion of said leading side portion, said third trailing portion including endwardly and downwardly sloping walls, so that a golfer, putting with the putter, can be guided by them to position his head with respect to both the putter and a ball to be putted by holding his head with respect to the putter in such position that a desired ratio of areas of the sloping sides of the middle trailing portion may be viewed by him when his head is in correct position with respect to the putter and a golf ball to be putted.

4,390,185

GASKETS

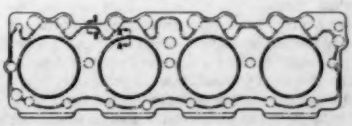
Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, County Durham, England

Filed Apr. 22, 1982, Ser. No. 370,922

Claims priority, application United Kingdom, May 1, 1981, 8113497

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—235 B **1 Claim**



1. A gasket for sealing a joint between the cylinder block and

the cylinder head of a wet liner internal combustion engine comprising a pair of outer metal plates having outwardly directed corrugations formed therein away from cylinder bore openings and a composite metal spacer plate disposed between the two outer plates, the said spacer plate comprising a central soft metal layer and hard metal surface layers bonded or integral therewith and extending into proximity with the individual cylinder bore openings said metal spacer plate being formed adjacent these openings on each axial face with circumferential serrations of V-shaped radial profile, the thickness of the spacer plate measured over the peaks of the serrations, before the gasket is installed being somewhat greater than that of the remainder of the spacer plate whilst the thickness measured between the troughs of the serrations is significantly less than that of the remainder of the spacer plate.

4,390,186

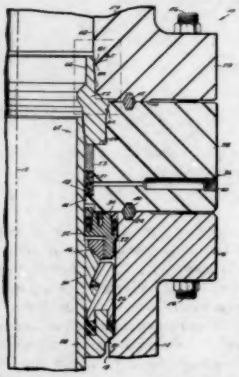
METAL-TO-METAL RIBBED SEAL

John K. McGee, Houston; Harold L. Lafferty, Manvel; Charles D. Bridges, and Archie L. Smith, both of Houston, all of Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 4, 1982, Ser. No. 345,797

Int. Cl.³ F16J *15/08*; E21B *33/12*

U.S. Cl. 277—236 **7 Claims**



1. A metal-to-metal seal for use in a high pressure environment typical of a wellhead assembly that is provided on a high pressure, high temperature gas well, comprising:

a tubular part having an outside circumferential surface leading to an end;

a relatively massive part having an internal chamber with an inside circumferential surface;

the tubular part being coaxially at least partially received in said internal chamber so that said inside circumferential surface of the relatively massive part surrounds said outside circumferential surface of the tubular part;

adjustable securement means associated with said tubular part and said relatively massive part for telescoping the tubular part into the internal chamber of the relatively massive part until a predetermined relative axial disposition of these parts is achieved;

said inside circumferential surface having a taper, said outside circumferential surface being relieved so as to have a substantially complementary taper over most of the axial extent thereof, but having at least one narrow band in which a respective prominant circumferential rib is externally formed on said tubular part on and intermediate the axial extent of said outside circumferential surface, said at least one narrow band being so prominant that when said adjustable securement means is adjusted to bring said tubular part and said massive part to said predetermined relative axial disposition is achieved, said at least one rib on said tubular part is in interference fit with said tapered inside circumferential surface on said relatively massive part, with a resilient circumferential engagement essentially characterized by incomplete crushing of said at least one rib.

4,390,187

VEHICLE LEVELING SYSTEM

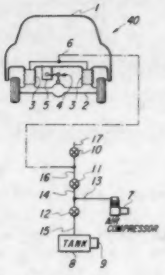
Koichi Maeda, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jan. 13, 1981, Ser. No. 224,740

Claims priority, application Japan, Jan. 18, 1980, 55-4721

Int. Cl.³ B60G *17/00*

U.S. Cl. 280—6 R **23 Claims**



13. A vehicle leveling system, comprising:

compression means for producing pressurized air;

means for accumulating the pressurized air produced by the compression means;

pneumatic spring means disposed between a chassis and a vehicle axle for setting the distance between the chassis and the vehicle axle by the pressurized air supplied thereto; and

means for controlling the supply of the pressurized air so that the pressurized air from the compression means is supplied only to the pneumatic spring means after a predetermined period of time has elapsed from the start of the supply of the pressurized air from said accumulating means to the pneumatic spring means until a predetermined distance is set between the chassis and the vehicle axle, the control means having a valve disposed in a conduit communicating the compression means with the accumulating means for supplying the pressurized air from the compression means to the accumulating means, a first sensor for detecting the pressure of the pressurized air in the accumulating means, a second sensor for detecting the low level of the vehicle height, and a timer for conducting the timer action in response to the signal from the timer indicating that the timer is in operation, the valve being closed by the signal from the timer indicating the end of the timer action during the actuation period of the second sensor and the valve being opened in response to the signal from the first sensor during the not-actuation period of the second sensor.

4,390,188

HIGH PRESSURE HYDRAULIC SYSTEMS

John A. Rouse, Warwickshire, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 28, 1981, Ser. No. 258,396

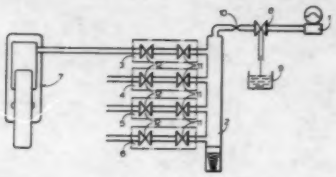
Claims priority, application United Kingdom, May 3, 1980, 8014937

Int. Cl.³ B62D *37/00*

U.S. Cl. 280—6.1 **15 Claims**

1. A high pressure hydraulic system comprising a slave unit, a source of hydraulic fluid for supplying said slave unit with

fluid under pressure, and a control valve assembly for controlling the supply of hydraulic fluid to said slave unit, said control valve assembly comprising first and second solenoid-operated valves, and first and second solenoids for respectively operating said first and second valves, a pressure differential acting across each of said valves also to operate said valves, said valves being oppositely acting and arranged in series with said first valve located between said source and said second valve, and said second valve located between said first valve and said slave unit, each one of said valves being movable into a closed position in which fluid flow through said one valve in a direc-



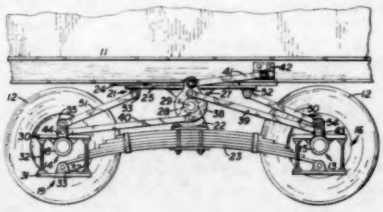
tion towards the other of said valves is substantially prevented, and an open position in which fluid flow through said one valve in both directions is permitted, said solenoids and said pressure differentials across said valves controlling movement of said valves between said open and said closed position, and each one of said valves comprising a seating member having a seating portion and a valve member having a complementary seating portion for engagement with said seating portion of said seating member, said seating portion of one of said members of said second valve comprising an element of elastomeric material to provide a substantially leakproof seal when said second valve is in said closed position.

4,390,189

SELF-STEERING BOGIES FOR TRAILERS

Milo A. Kunau, Box 303, Miles, Iowa 52064

Filed Mar. 30, 1981, Ser. No. 248,922
Int. Cl.³ B62D *13/00*
U.S. Cl. 280—81 A **4 Claims**



1. A steerable bogie comprising:

An upper main frame to carry a load, a front and a rear tandem axle assembly, each of said assemblies having an axle housing and road wheels, a right and a left shackle spaced apart on each of said axle housings, each of said shackles having an upper rigid member secured across a respective one of said axle housings and a lower rigid member spaced in a normal position below said upper rigid member, and flexible supporting means secured between said respective upper and lower rigid members to permit limited relative movement of said respective rigid members from said normal position in forward and rearward directions,

pivotal means connected to the lower side of said main frame, said pivotal means having a lower pivotal plate and a central pivot in an upper central position of said bogie, said lower pivotal plate being rotatable horizontally about said central pivot over a limited range, a first suspension connected between said lower rigid members of each of said right shackles and having a respective upward extending means connected to said lower pivotal plate, a second suspension connected between said lower rigid members of each of left shackles and having a respective upward extending means connected also to said lower pivotal plate, said load being applied through said pivotal means, said suspensions, and said flexible supporting means successively to said axle housings and said road wheels,

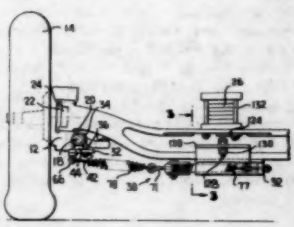
right connectors secured to each of said axle housings adjacent each of said right shackles, left connectors secured to each of said axle housings adjacent each of said left shackles, linkage-and-lever means having guiding linkage means connected to each of said right and left connectors, lever means pivotally connected to said lower pivotal plate, and steering linkage means connected between said lever means and said upper main frame to actuate said lever means in unison with rotation of said upper main frame with respect to said lower pivotal plate, said guiding linkage means being connected between said lever means and said connectors of said axle housings, said linkage-and-lever means during straight travel of said upper main frame positioning said respective upper and lower rigid members of said shackles in said normal positions for positioning said axle assemblies for straight tracking of said road wheels, and said linkage-and-lever means in response to turning of said upper main frame in either direction as desired with respect to said lower pivotal plate moving said upper rigid members of said shackles relative to said respective normal positions of said lower rigid members in the required directions for turning said axles in opposite directions as required about respective control vertical axes to facilitate turning said load in a desired direction.

4,390,190

STEERING STABILIZER STRUCTURE FOR THE FRONT WHEELS OF A VEHICLE

Doyle H. Worsham, P.O. Box 231, Boaz, Ala. 35957

Continuation-in-part of Ser. No. 102,103, Dec. 7, 1979, Pat. No. 4,313,613. This application Aug. 28, 1981, Ser. No. 297,506
Int. Cl.³ B62D *7/08*
U.S. Cl. 280—94 **14 Claims**



1. Steering stabilizer structure for the steering wheels of a vehicle designed to be affixed beneath each extremity of the axle thereof and attached to the wheel steering arms at the steering knuckles, said structure including a wheel camber plate adapted to be located adjacent the underside of the steering knuckle sleeve and disposed longitudinally of said vehicle, means for securing said camber plate to the steering arm, a recovery bar spaced inwardly of said camber plate, at least a first pair of spaced apart spring means connected between said bar and plate, said recovery bar having a fulcrum pin slightly offset from its center and adapted to underlie the vehicle axle, a mounting member having means for fixed attachment to the underside of the vehicle axle, a second pair of spring means connected between said mounting member and said recovery

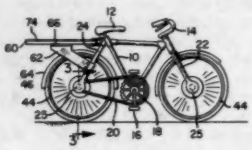
bar urging the recovery bar away from said camber plate, and guide means on said recovery bar and mounting member restraining said fulcrum pin to move rectilinearly below and parallel to the vehicle axle, whereby turning movement of the vehicle wheel will move the recovery bar away from the mounting member and toward the wheel and will be resisted by said first and second spring means.

4,390,191

BICYCLE CONSTRUCTION

Otto H. Acker, P.O. Box 2, Washougal, Wash. 98671

Filed Oct. 27, 1980, Ser. No. 201,165
Int. Cl.³ B62K *19/00*
U.S. Cl. 280—281 R 2 Claims



1. A bicycle construction comprising
(a) a main frame having front and rear ends,
(b) a single wheel support arm depending integrally from each of said front and rear ends of the frame,
(c) said support arms being offset throughout their length from said main frame,
(d) a wheel support assembly at the lower ends of each of said arms,
(e) each of said wheel support assemblies including an integral spindle extending laterally from one side of said arms adjacent the bottom,
(f) said support arms having a second offset adjacent the bottom thereof on the side facing the wheel support assemblies,
(g) a bearing housing having rotatable support on said spindle,
(h) radially extending flange means on the exterior of said bearing housing,
(i) a wheel having a hub portion, an outer rim, and radial spokes secured at one of their ends to said rim,
(j) said hub including a vertical support wall,
(k) fastening means associated with said support wall releasably securing said hub to said flange,
(l) a sprocket wheel at said rear end secured between said radially extending flange and said support wall for operating in the area provided by said second offset,
(m) a peripheral right angle flange on said support wall of said hub secured to the other end of said spokes,
(n) and foot operated drive means connected between said frame and said sprocket wheel (assemblies) for propelling the bicycle.

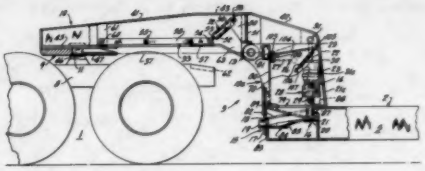
4,390,192

TRAILER GOOSENECK APPARATUS

Wilbert A. Wagner, U.S. Highway 20, Garden Prairie, Ill. 61038

Filed Dec. 16, 1980, Ser. No. 217,050
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—425 A 15 Claims

1. A gooseneck apparatus adapted for releasably connecting a truck-tractor unit to a trailer unit having trailing wheel means, said truck-tractor unit and trailer unit adapted to be locked in place to oppose relative inline movement, comprising a horizontal section having a forward tractor pivot means for releasably connection to a tractor, a vertical section depending from the trailing end of said horizontal section, a pivot support means connecting said vertical section to said horizontal section, power means connected between said horizontal section and said vertical section for relatively positioning said vertical section about said pivot support means, a vertical trailer coupling means having a first member connected to the forward end of the trailer unit and a second member connected to the bottom end of said vertical section, a horizontal coupling means having a first member connected to said vertical section and a second member connected to said trailer unit and establishing a pivotal horizontal connection, and said horizontal and vertical sections being constructed and arranged with a releas-



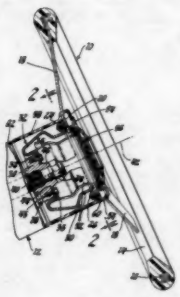
able load transmitting means and said pivot support means and said power means movable from a load transport position to a release position establishing relative pivoting movement between the horizontal and vertical sections with an essentially constant operative spacing of the tractor pivot means and the coupling means whereby said truck-tractor unit and said trailer unit may be locked in position and said gooseneck apparatus released from the trailer unit without relative in-line movement therebetween.

4,390,193

ENERGY ABSORBING STEERING WHEEL ASSEMBLY

Robert M. Strahan, Dayton; Philip W. Hopf, Centerville, both of Ohio, and Phillip G. Williams, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 7, 1980, Ser. No. 166,549
Int. Cl.³ B60R *21/02*
U.S. Cl. 280—777 3 Claims



1. A steering wheel operatively interconnected to a rotatable steering shaft of a steering column and thereby being disposed at a predetermined position in a vehicle, said steering wheel comprising an outer rim and an inner hub interconnected to one another by a plurality of spokes which space said rim outwardly of said hub, an energy absorbing coupling operatively connected to an end portion of said steering shaft for yieldably supporting said steering wheel axially outwardly from the end of said steering shaft, said energy absorbing coupling being of a plastically deformable material having an annular base drivingly connected to said steering shaft and having a plurality of arcuately spaced and separate energy-absorbing legs extending upwardly from said base and surrounding the longitudinal steering axis of said steering shaft, each of said legs having a radial and inwardly extending bend therein located at a predetermined distance above said base and

terminating in an outwardly extending foot portion, fastener means connecting each said foot portion to said inner hub of said steering wheel such that an inertia force of at least a predetermined magnitude directed to a lower portion of said rim will compressively load and buckle said legs of a corresponding lower portion of said coupling while tensioning said legs of an upper portion of said coupling to thereby turn said steering wheel on an axis transverse to said steering axis and from said predetermined position to a second position angularly disposed with respect to said predetermined position so that additional portions of said rim will receive said force for transmission to and subsequent compressive deformation of all of said legs for energy dissipation.

4,390,194

RECORDING MATERIAL

Atsushi Sato, Tokyo; Isoo Shimizu, and Naoya Takahashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,708
Claims priority, application Japan, Jun. 25, 1980, 55-86191
Int. Cl.³ B41M *5/16, 5/22*
U.S. Cl. 282—27.5 **6 Claims**

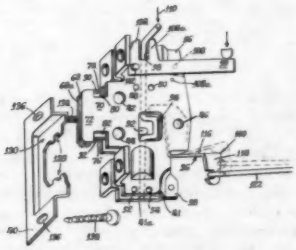
1. A recording material comprising a sheet material having thereon a layer of microcapsules containing an electron donating dye-precursor and a solvent mixture for said dye-precursor, characterized in that said solvent mixture consists essentially of 5 to 50 wt % of 1-methyl-3-phenylindane and 95 to 50 wt % of at least one diarylalkane.

4,390,195

VEHICLE LOCKING MECHANISM

Walter T. Cox, 95 Nancy Dr., and Edward F. Tannery, 14537 Iyopawa Island, both of Coldwater, Mich. 49036

Filed Feb. 23, 1981, Ser. No. 236,839
Int. Cl.³ E05C *3/22*
U.S. Cl. 292—53 **12 Claims**



1. A locking mechanism for a vehicle door or hatch comprising:

a casing including a pair of support plates fastened together in spaced relation and having mutually facing inner, parallel surfaces defining a space therebetween;

said casing having a T-shaped tongue portion including identical, spaced, congruent, T-shaped tongues along corresponding edges of said plates adapted to extend outwardly beyond the edge of a door into a strike fastened to a vehicle frame, said tongues having congruent central stems and relatively wider congruent heads at the outer ends thereof defining a pair of strike-engageable recesses in said casing under opposite ends of the heads;

a pair of flat, blade-like bolt members pivotally connected to said support plates, disposed in side-by-side coplanar relationship in the space between said support plates and in slidable, constrained relation with said inner, parallel surfaces, said bolt members having outwardly extending latch portions disposed side-by-side between said T-shaped tongues, said bolt members being pivotally movable to a closed position in which the latch portions thereof are extended into said recesses, said bolt members further being pivotally movable to open positions in which the latch portion thereof are retracted from said recesses into the space between said stems;

means interconnecting said bolt members for simultaneous movement between said closed and open positions;

spring means biasing said bolt members toward their said closed positions;

a slide member movably supported in said casing in position to engage at least one of said bolt members and effective when moved in one direction to move said bolt members toward their open position against the bias of said spring means;

said slide member having a transversely movable portion which is movable in a direction transverse to said one direction between positions determining locked and unlocked mode positions of said slide member;

a bolt actuator member movably supported in said casing and engageable with said transversely movable portion of said slide member when the slide member is in its said unlocked mode position, and not engageable therewith when the slide member is in its said locked mode position;

whereby movement of said slide member to its said unlocked mode position enables said actuator member to move said slide member in said one direction and thereby move said bolt members to their open position; and

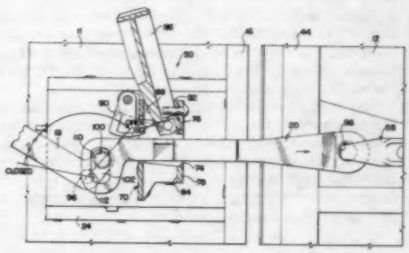
whereby further movement of said slide member to its said locked mode position disables said actuator from moving said slide member and said bolt members.

4,390,196

SLIDING DOOR STARTER AND CLOSER

Thorvald Madland, Arlington Heights, Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Continuation of Ser. No. 32,386, Apr. 23, 1979. This application Oct. 2, 1981, Ser. No. 307,880
Int. Cl.³ E05C *11/00*
U.S. Cl. 292—66 **5 Claims**



1. In a railway house car having a door opening and a door, a structural member adjacent said door opening and a mounting member secured to said structural member; a door driver for moving said door between a first and a second position comprising: a manually operable lever having a crank arm; said lever being rotatably mounted by means of said mounting member on said structural member for rotation through an arc of 120°; a boss on said crank arm; a hasp means having an end opening for receiving said boss; said hasp means end opening having a cam surface providing mechanical advantages of different desired magnitudes within a range of approximately 8 to 1, to approximately 46 to 1, ignoring friction, for opening, closing, locking and unlocking said door depending on the direction of rotation and the angular position of said crank arm to provide an appropriate force for the particular position and direction of movement of the door; and said hasp means in selective interconnection with said boss on said crank arm

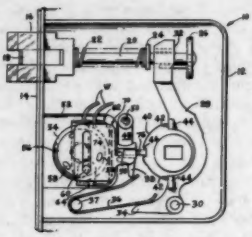
when said lever is in a vertical position thereby selectively to maintain said door in a closed and locked position in a condition of relative great mechanical advantage urging said boss in said hasp means end opening during the locking operation relative to the unlocking operation.

4,390,197

ELECTRICALLY CONTROLLED LATCH

Lawrence D. Butts, Charlotte, N.C., assignor to Scovill Inc., Waterbury, Conn.

Filed Sep. 28, 1981, Ser. No. 306,185
Int. Cl.³ E05B 47/00
U.S. Cl. 292—144 **5 Claims**



1. A latch having electric dogging means controlling the operating means and comprising:
(a) a housing;
(b) an operating spindle hub journaled in the housing and having a dog-engaging surface thereon;
(c) a latch means in the housing;
(d) means operatively connecting the hub and the latch means; and
(e) electric dogging means comprising:
1. an electric solenoid having a rotary output plate mounting at a point spaced from its center of rotation a drive pin, the plate rotating from a first position to a second position upon activation of the solenoid;
2. a dogging slide including a flat portion disposed against the output plate but having a transverse elongate slot receiving the drive pin and a dogging blade portion adapted to engage the dogging surface in either first or second position of the plate;
3. spring means associated with the solenoid and biasing the plate toward the first position, the mounting of the solenoid and spring permitting 180° reversible disposition so that depending on that disposition, the pin is disposed respectively in opposite ends of the slot thereby either dogging the hub in solenoid activated or in solenoid deactivated condition.

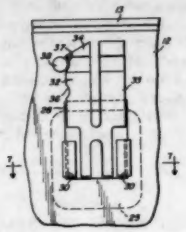
4,390,198

MOLDED MULTIFUNCTION LATCH MECHANISM

George J. Selinko, Lighthouse Point, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 27, 1980, Ser. No. 153,662
Int. Cl.³ E05C 1/04
U.S. Cl. 292—152 **7 Claims**

1. A one-piece springless fingerlike latch mechanism for use on a portable, hand-held device having a housing and a door movable in relation thereto and wherein the door is slidable between first and second positions and has an opening therein, such latch mechanism including in combination:
an actuating portion on one side of the slidable door for operating the latch mechanism in lateral rectilinear movement;
a coupling portion connected to said actuating portion and extending through the opening in the slidable door, and said coupling portion having resilient ribs engaging the opposite side of the slidable door for holding the latch mechanism in said rectilinearly movable relation on the slidable door; and
a springless latching portion formed integrally with said



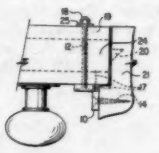
actuating portion and said coupling portion, and laterally slidable by said actuating portion between a first set released position and a second set latched position engaging the housing.

4,390,199

LATCH AND LOCK GUARD

William H. Taylor, Owen Sound, Canada, assignor to Hutch Protective Devices Ltd., Owen Sound, Canada

Filed Apr. 24, 1981, Ser. No. 257,270
Int. Cl.³ E05C 21/00
U.S. Cl. 292—346 **9 Claims**



1. A latch and lock guard for doors comprising a pair of similar elongated bars of sufficient width and thickness for purposes of rigidity, each bar having a flat base, a series of uniform, regularly spaced teeth extending integrally from the bar sideways along one edge, the width of the spaces between the teeth being slightly greater than the width of the teeth, means to secure solidly one bar to the external side of a door over the lock area with its teeth pointing towards the adjacent door edge, and means to secure solidly the other bar to the door jamb with its teeth pointing towards the door edge, the teeth of one bar to fit within the slots between the teeth of the other, and vice versa in interlocking fashion when the door is in closed position.

4,390,200

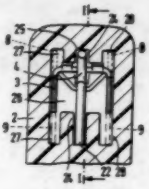
SIDE HANDLE FOR UTENSILS

Wolfgang Fischbach, Dauden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,710
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009766; Mar. 25, 1980, 8008180[U]
Int. Cl.³ A47J 45/06
U.S. Cl. 294—27 H **5 Claims**

1. A handle apparatus for a utensil, comprising a supporting bracket secured to a wall of said utensil and having two laterally spaced and generally parallel side walls extending away from said wall of said utensil approximately perpendicular thereto, a handle having an abutment surface engaging said

wall of said utensil and a recess in said abutment surface in which said supporting bracket is slidably received, said recess being of generally rectangular cross-sectional shape and having spaced, generally parallel side surfaces and spaced, generally parallel top and bottom surfaces extending between said side surfaces, said top and bottom surfaces each having two laterally spaced grooves therein adjacent and generally parallel to respective said side surfaces, said side walls of said supporting bracket each being substantially parallel to and adjacent a respective said side surface of said recess, and each said side wall of said supporting bracket having two portions slid-



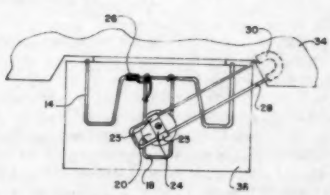
ably disposed in respective said grooves in said top and bottom surfaces of said recess, and retaining means disposed in said handle recess and cooperable with said supporting bracket for releasably securing said handle on said utensil, said retaining means resiliently urging said supporting bracket into engagement with said top surface of said recess and said abutment surface on said handle into engagement with said wall of said utensil, whereby said adjacency of said side walls of said bracket and said side surfaces of said recess and said engagement of said portions of said side walls of said bracket with said grooves in said recess substantially prevents twisting movement of said handle relative to said utensil.

4,390,201

LICENSE PLATE HOLD-OPEN DEVICE

Alton M. Saunders, 418 Seville Ave., Altamonte Springs, Fla. 32701

Filed Nov. 28, 1980, Ser. No. 211,015
Int. Cl.³ B62D 25/00
U.S. Cl. 296—1 C **11 Claims**



11. A device for holding a license plate of a vehicle in an open position, the license plate being attached to a backing plate connected to the vehicle and biased into a substantially vertical position, said device comprising:

a first means slidably engaged with and secured to the backing plate,

an elongated second means to engage the vehicle,

a third means hingedly connected to said first means,

said second means slidably and rotatably connected to said third means,

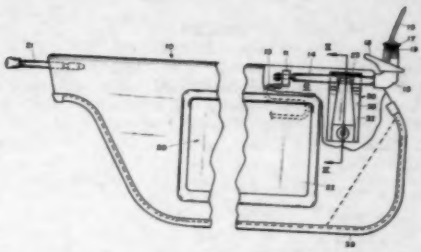
means biasing said third means into engagement with the backing plate upon movement of the backing plate to a generally horizontal position said second means being movable into engagement with the vehicle to hold the backing plate into a generally horizontal position.

4,390,202

VISOR CONTROL

Carl Flowerday; Konrad H. Marcus, both of Holland; Gordon Kempkers, Hamilton; Edward T. Boerema, Zeeland, and Dennis J. Fleming, Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed May 26, 1981, Ser. No. 267,431
Int. Cl.³ B60J 3/02; F16C 17/00
U.S. Cl. 296—97 K **31 Claims**



1. A visor control for a vehicle mounted visor for providing snap-up operation of the visor against the vehicle's headliner comprising:

a visor body including a cylindrical pivot rod extending therein along one edge of said body; and

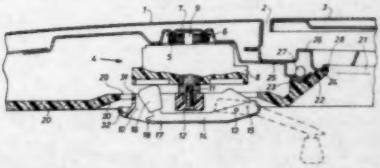
a visor control member positioned in said visor body and including a bifurcated portion extending into engagement with one side of said pivot rod, and a second portion defining an elastically deformable plate extending to engage an opposite side of said pivot rod in alignment in opposed relationship between the bifurcated portion, wherein said pivot rod includes at least a flat formed in said opposite side for engagement by said plate to provide a torque to said visor body to return said visor body to a stored position adjacent the vehicle headliner as the visor is moved toward the stored position and releasably hold the visor in the stored position.

4,390,203

VEHICLE ROOF AND HEADLINING THEREFOR

Alfons Lutz, Emmering, and Georg Kohlpainter, Maisach, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,825
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002246
Int. Cl.³ B60J 7/02
U.S. Cl. 296—223 **9 Claims**



1. An automobile roof with a roof aperture, a closure panel that is displaceable for opening and closing said aperture, said panel being interchangeably displaceable by means of a crank handle mechanism and a motorized drive mechanism, and with a roof headliner covering the underside of the roof and comprising a rigid, resilient material, said headliner having a cutout essentially corresponding in shape and position to the roof aperture, wherein the roof headliner is provided in a zone

lying, with reference to the front and rear of the vehicle, in front of a forward edge of the headliner cutout, with a substantially circular perforation into which fits a round anchor plate for a foldable crank arm constituting part of the crank handle mechanism, said crank arm, in a folded position, being received by a hiding niche formed in the round anchor plate; and wherein a shield is provided for covering the perforation when using the motorized drive mechanism in place of said crank handle mechanism.

4,390,204

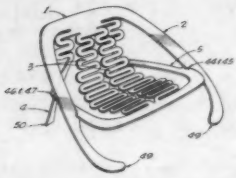
PORTABLE FURNITURE

Gregg Fleishman, 6071 Hargis St., Los Angeles, Calif. 90034

Continuation-in-part of Ser. No. 866,837, Jan. 4, 1978, Pat. No. 4,202,581. This application Feb. 22, 1980, Ser. No. 123,903

Int. Cl.³ A47C *4/00*

U.S. Cl. 297—16 **11 Claims**



1. Portable furniture including at least one generally planar support member,

said planar support member comprising integral main, tab, arm and leg portions resiliently disposable in angular and curvilinear relationship to each other,

said tab portion comprising a seating surface for supporting an individual therein,

said main portion being connected to said tab portion and to said leg portions at the upper end of said tab portion,

said arm portions being connected to the opposite end of said tab portion,

said portable furniture having integral interlocking means releasably engaging said, arm, leg and main portions for maintaining said angular relationship,

said portable furniture returnable by means of its resilience to its original planar configuration when said interlocking means are disengaged.

4,390,205

CONVERTIBLE SEAT FOR A MOTOR VEHICLE

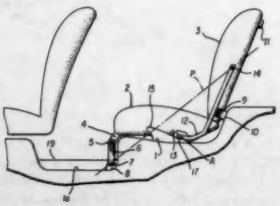
Llorente Louis, Mantes-la-Ville, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 28, 1981, Ser. No. 268,100

Claims priority, application France, Jun. 3, 1980, 80 12269

Int. Cl.³ A47C *13/00*

U.S. Cl. 297—129 **4 Claims**



1. A convertible seat for a motor vehicle, movable between a normal position and a folded position, and comprising:

a seat portion pivotable about a first transverse axis;

a back portion pivotable about a second transverse axis;

a link member having one end pivoting about a third transverse axis fixed to said vehicle and another end pivoting about said first transverse axis;

a connecting bar pivoted to said seat portion at a fourth transverse axis and to said back portion at a fifth transverse axis, so as to ensure simultaneous movement of said seat and back portions; and

a guide means fixed to said vehicle and contacting a portion of said connecting bar for guiding said portion of said connecting bar during movement of said seat portions;

wherein said axes are positioned such that fourth axis is below a plane containing said third and fifth axes when said seat is in said normal position, and wherein said guide means is contoured to guide said fourth axis above said plane when said seat is moved to said folded position.

4,390,206

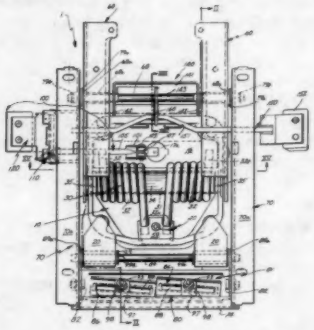
SYNCHROTILT CHAIR CONTROL

Frederick S. Faiks, Greenville; Charles C. Pergler, Grand Rapids; Ronald L. Whitwam, Caledonia; Jack R. Knoblauch, Byron Center; Duane M. Beukema, Grand Rapids, and Kenneth W. Hozeski, Grandville, all of Mich., assignors to Steelcase, Incorporated, Grand Rapids, Mich.

Filed May 1, 1980, Ser. No. 145,854

Int. Cl.³ A47C *1/032*

U.S. Cl. 297—300 **66 Claims**



1. In a synchrotilt chair control having a stationary control housing, resilient biasing means mounted in said stationary control housing, chair back support means pivotally mounted on said stationary control housing and operably interconnected with said resilient biasing means, and chair seat support means mounted on said stationary control housing and operably connected to said chair back support means for rearward tilting with said chair back support means, but at a different rate with respect thereto, against the biasing action of said resilient biasing means in response to a person leaning back in a chair to which said control is mounted, the improvement comprising; said stationary housing including track means; said seat support means being pivotally connected directly to said chair back support means and including first pivot axis means slidably mounted in said track means whereby said seat support means is free to shift relative to said stationary housing when a user tilts rearwardly in a chair mounted on such chair control; seat adjustment means including a pivot bracket pivotally mounted to said first pivot axis means and to said seat support means on a second pivot axis; whereby said seat adjustment means can be actuated to rotate said pivot bracket about said second pivot axis, thereby sliding said first pivot axis means in said track means, and changing the relative elevation of said first pivot axis means with respect thereto and thereby changing the pitch of said seat support means with respect to said stationary housing, whereby said first pivot axis means being

slidably mounted in said track means not only allows said seat support means to freely shift relative to said stationary housing when a user tilts rearwardly in a chair mounted on such a chair control, but also allows said seat adjustment means to be shifted and change the pitch of said seat support means.

4,390,207

BUCKET SEAT

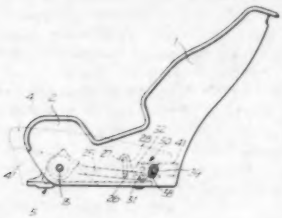
Jörg Resag, Plattenhardt; Walther Göldner, Ebershach, and Horst Treiber, Stuttgart-Riedenberg, all of Fed. Rep. of Germany, assignors to Recaro GmbH & Co., Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,521

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951645

Int. Cl.³ A47C *1/025*

U.S. Cl. 297—362 9 Claims



1. Bucket seat comprising:

a seat portion,

a back shell forming a backrest,

two hinge fittings supporting the back shell so as to be pivotable relative to the seat portion and being capable of locking in a selectable pivot position, said hinge fittings being arranged on the respective sides of the seat portion, and

a connecting shaft operationally connecting and extending from one hinge fitting to the other, said connecting shaft being positioned beneath the front half of the seat portion and being the pivot axis about which the back shell is pivotable for adjusting only the inclination of the backrest without adjusting the seat portion.

4,390,208

INERTIA RESPONSIVE SEAT BACK LATCHING MECHANISM

Paul Widmer, Warren, and Robert R. Mercer, Ortonville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1981, Ser. No. 257,650

Int. Cl.³ B60N *1/02*

U.S. Cl. 297—379 4 Claims

1. A seat assembly for an automotive vehicle comprising:

a seat cushion supported on a seat frame means which is adapted to be mounted to vehicle support structure,

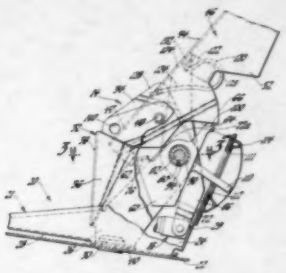
a backrest including a side hinge arm pivotally supported by said seat frame means for movement about a first pivot axis between a first position in which said backrest is generally vertically disposed and a second position in which said backrest overlies at least a portion of said seat cushion,

said hinge arm having integral spaced first and second abutments movable therewith in a path of movement concentric with said first pivot axis,

a one-piece inertia responsive latch means pivotally supported by said seat frame means for movement about a second pivot axis, said latch means comprising a U-shaped member having a pair of spaced side walls and a bight portion at one end which defines a first abutment, one of said side walls at its end remote from the bight portion having a leg portion extending transversely thereof and which defines a second abutment, the other of said side walls including a handle portion which extends through an aperture in said seat frame whereby the latch lever means can be manually manipulated, if necessary,

said latch means being gravity biased for movement toward a position in which the first abutment thereof would not be disposed within the path of movement of said first abutment of said hinge arm,

said second abutment on said hinge arm being engageable with the second abutment of said latch means when in its



first position to hold said latch means against its gravity bias in an operative position in which the first abutment thereof is disposed within the path of movement of said first abutment of said hinge arm,

said latch means due to its gravity bias being pivotally movable with the hinge arm of the backrest when the latter is slowly moved from its first position toward its second position,

said latch means, due to inertia forces, remaining in its operative position to prevent movement of said hinge arm and backrest toward its second position when said seat assembly is subjected to rapid deceleration forces.

4,390,209

PLASTIC SEAT-BACK FRAMEWORK AND METHOD FOR THE MANUFACTURE THEREOF

Sadami Izuno; Isao Kiyomitsu, and Toshihiko Tsuji, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd. and Delta Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Jan. 8, 1981, Ser. No. 223,292

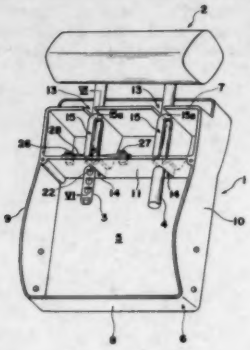
Claims priority, application Japan, Jan. 25, 1980, 55-8020; Jan. 25, 1980, 55-8021

Int. Cl.³ A47C *7/36*

U.S. Cl. 297—410 3 Claims

1. A plastic seat back framework of one-piece construction made of a moldable synthetic resin together with a head rest support adapted to axially adjustably support a pair of spaced legs which form a part of the head rest assembly together with a head rest, which comprises a generally rectangular body having a surrounding reinforcement frame protruding generally at right angles to and from the perimeter of the rectangular body, said reinforcement frame being constituted by upper and lower walls opposite to each other and a pair of opposite side walls, said rectangular body also having a connecting wall extending between the opposite side walls in parallel relation to the upper wall with its opposite ends integral respectively with the side walls and spaced a predetermined distance from the upper wall to define a support space therebetween, said upper wall having a pair of spaced first support notches of generally U-shaped configuration defined therein and extending transversely thereof, said connecting wall having a pair of spaced second support notches of generally U-shaped configuration defined therein and extending transversely thereof, said first and second support notches extending in the opposite

directions with respect to each other, and said head rest support comprising a pair of guide members of generally U-shaped cross-section each of said guide member having an elongated aperture extending therethrough for the support of a substantially intermediate portion of the corresponding leg, each of said guide members being integrally formed on the rectangular body and positioned within the support space with the elongated aperture aligned at one end with a portion of the corresponding first support notch and at the other end with a portion of the corresponding second support notch, the head rest assembly being adapted to be mounted on the seat back framework with the legs inserted through that portions of the first support notches, then through the apertures in the guide members and finally through that portions of the second support notches, respectively.

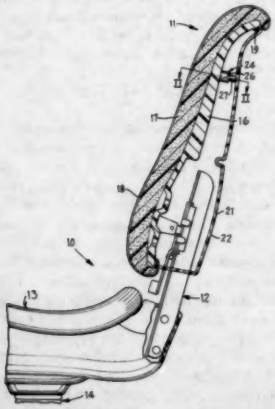


4,390,210

BLIND CONNECTING STRUCTURE FOR INNER AND OUTER SHELLS OF CHAIR BACK

Joseph M. Wisniewski, Marne, and Walter C. Mrotz, III, Comstock Park, both of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

Filed Dec. 15, 1980, Ser. No. 216,734
Int. Cl.³ A47C 7/40
U.S. Cl. 297—452 **2 Claims**



1. In a chair having a leg-supported seat structure and a back structure projecting upwardly from the seat structure, the back structure including an interior support panel and a cushion structure overlying the front-facing surface of the support panel, the cushion structure having edge portions which wrap around the edge portions of the interior support panel, the back structure also including a back panel which is spaced from but substantially coextensive with the interior support panel and defines the exterior rear surface of the back structure, the opposed edge portions of the interior and back panels clamping the edge portions of the cushion structure therebetween, and a plurality of hidden connecting structures disposed between and fixedly joining said interior and back panels together, the improvement wherein said connecting structures permit the spacing between the panels to vary during assembly to compensate for the interposed edge portions of the cushion structure, each said connecting structure comprising:

a sleevelike hub fixed to and projecting outwardly from one of said panels toward the other said panel, said hub defining therein a cylindrical opening which projects axially inwardly of the hub from the free end thereof, means fixedly associated with said hub for defining a substantially annular shoulder which projects radially inwardly into said opening at a location spaced axially inwardly from the free end thereof, said shoulder being directed axially toward the free end of said hub, and said opening being of a stepped configuration and including (1) a first opening portion which extends from said free end to said shoulder and (2) a second elongated opening portion which is of substantially smaller diameter and extends axially inwardly of said hub from said shoulder;

a cylindrical shaftlike projection fixed to the other panel and projecting outwardly therefrom toward said one panel, said projection having a cross section which is substantially smaller than the diameter of said second opening portion so as to enable said projection to project axially into said hub through a sufficient distance so as to pass a substantial distance axially past said shoulder with a substantial annular clearance space being defined between said projection and the boundary walls of said first and second opening portions;

said interior panel having a nonplanar contour and being molded of a plastics material, said hub being integral with and projecting rearwardly from said interior panel, said back panel having a nonplanar contour and being molded of a plastics material, said projection being integral with said back panel and projecting forwardly therefrom;

one-piece resilient fastener ring means positioned between said projection and said hub and grippingly engaging both thereof to prevent said projection from being relatively axially withdrawn from said hub while enabling the projection to be axially inserted into said hub through any selected axial extent while still permitting the projection to be axially fixed relative to the hub to thereby provide for optimum clamping of the edge portions of the cushion structure between the opposed edge portions of the interior and back panels, said ring means maintaining said hub and projection in spaced relationship wherein they are free of sliding or abutting surface engagement;

said one-piece resilient fastener ring means including a first set of spring teeth which grippingly engage a surrounding wall on said hub for preventing said ring means from being axially withdrawn from said hub through the free end thereof, said ring means also including a second set of spring teeth which grippingly engage the exterior peripheral surface of the projection for preventing the latter from being axially withdrawn from the hub through the free end thereof;

said fastener ring means comprising a substantially flat platelike washer seated on said shoulder, said first set of teeth comprising outer teeth which are fixed to the outer peripheral edge of the washer and project radially outwardly therefrom for gripping engagement with the hub wall defining said first opening portion, and the second set of teeth comprising inner teeth which are fixed to the inner peripheral edge of the washer and project radially inwardly thereof for gripping engagement with the exte-

rior peripheral surface of the projection, said outer teeth sloping axially toward the free end of the hub as they project radially outwardly, and said inner teeth sloping axially away from the free end of the hub as they project radially inwardly, whereby the outer and inner teeth slope in axially opposite directions so that they each create a one-way gripping engagement which prevents both the fastener ring means and the projection from being moved axially relative to the hub toward the free end thereof, said fastener ring means permitting the projection to be freely axially moved relative to the hub in the other axial direction; and

said flat platelike washer having an inner diameter which is approximately the same as the inner diameter of said annular shoulder so that said inner teeth project radially inwardly therefrom across said annular clearance space to facilitate the resilient deformation of the inner teeth and their gripping engagement with the exterior peripheral surface of said projection.

4,390,211

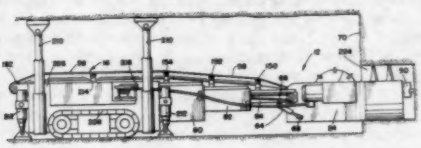
CONTINUOUS MINER WITH CUTTER ASSEMBLY ATTITUDE ADJUSTMENT

Thomas M. Thompson, Rte. 1-Box 122A, Beverly, W. Va. 26253

Division of Ser. No. 53,439, Jun. 29, 1979, Pat. No. 4,312,540. This application Dec. 2, 1981, Ser. No. 326,035

Int. Cl.³ E21C *27/24*

U.S. Cl. 299—57 **3 Claims**



1. A cutter assembly for a continuous miner comprising in combination:

a. a frame adapted to be pivotally supported by the continuous miner;

b. a pair of spaced apart generally longitudinally directed augers supported by said frame;

c. cutters disposed at the forward end of each of said longitudinally directed augers and adapted to be rotated into cutting engagement with a coal face or seam;

d. a tranverse auger extending generally between said longitudinally directed augers and rearward of said cutters;

e. a generally U-shaped pan supported by said frame and disposed below said longitudinally directed augers and said transverse auger, said pan having an upwardly sloping rear wall which permits coal to be fed upward to a receiving belt;

f. drive means to provide a rotational force to said longitudinally directed augers and said transverse auger; and,

g. means supported by the continuous miner for attitude adjustment of said cutter assembly at the pivotal interconnection of said cutter assembly and the continuous miner.

4,390,212

MACHINE FOR MINING THIN SEAMED HARD MATERIAL IN-SITU BETWEEN ADJACENT AUGER HOLES

Leonard R. Nitzberg, 1413 Buckeye La., Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 894,424, Apr. 7, 1978, Pat. No. 4,205,881. This application Jun. 2, 1980, Ser. No. 155,140

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ E21C *27/24*

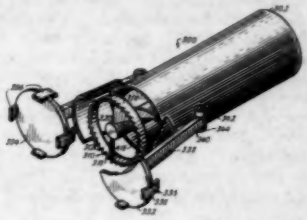
U.S. Cl. 299—57 **13 Claims**

1. A mining machine suitable for being drivingly connected to a conventional mining apparatus and for removing hard material in-situ between two adjacent auger holes, said machine comprising:

cutting means for mechanically contacting and dislocating hard material in-situ between two adjacent and pre-existing auger holes, said cutting means rotating about an axis substantially parallel with the longitudinal axis of said machine,

power operated means for driving said cutting means said power operated means being connected at one of its ends to said conventional mining apparatus and connected at its opposite end to said cutting means,

guide means for maintaining said cutting means in mechanical contact with said hard material in-situ between two



adjacent, pre-existing, auger holes, said guide means including one of a pair of guides for inserting into one of said auger holes and the other of said guides for inserting into the other one of said non-parallel auger holes, said pair of guide means being free to move relative to each other such that each one of said pair can advance along the length of the respective adjacent pre-existing, auger holes in which it is inserted as said mining machine is advanced during the in-cutting operation along the length of said hard material in-situ between said adjacent auger holes, and

means for collecting said hard material dislocated by said cutting means.

4,390,213

DECELERATION-SENSITIVE BRAKING PRESSURE CONTROL DEVICE

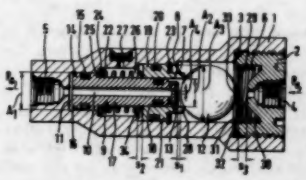
Volker Berisch, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 14, 1981, Ser. No. 263,669

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3021952

Int. Cl.³ B60T *8/14*

U.S. Cl. 303—24 A **14 Claims**



1. A deceleration-sensitive braking pressure control device for a vehicular hydraulic brake system comprising:

a housing having a stepped bore coaxial of a longitudinal axis;

a stepped piston disposed in said bore coaxial of said axis, said piston including a first section having a relatively small active surface facing a braking pressure inlet chamber disposed in said bore and a second section sealed to

and slidable in said bore, said second section having a relatively large active surface facing a braking pressure outlet chamber disposed in said bore;

a sleeve disposed in said bore in a slidable sealed relationship therewith encircling a first portion of said first section in a slidable sealed relationship therewith;

a first spring disposed in said bore between a first step in said piston joining said first and second sections and the adjacent end of said sleeve to preload said piston;

a channel disposed in said piston coaxial of said axis enabling said inlet chamber to communicate with said outlet chamber;

a valve including a valve seat disposed adjacent said small active surface in an operative relationship with an adjacent end of said channel and a closure member disposed in said inlet chamber movable therein in an operative relationship with said valve seat in a deceleration-sensitive manner to control the communication between said inlet and outlet chambers; and

a stop for said closure member carried by the adjacent end of said sleeve to ensure that in the rest position of said piston a minimum distance is guaranteed between said closure member and said valve seat, said sleeve being displaceable by inlet pressure against the force of said first spring by an amount greater than said minimum distance.

4,390,214

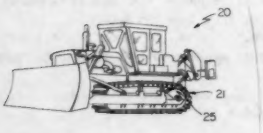
CRAWLER TRACK STRUCTURE HAVING WEAR SURFACE

Jonas L. Gunter, Canton; Doyle V. Haren, Clyde; Anatoli Hofle, and Richard D. Medford, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 128,338, Mar. 7, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,556

Int. Cl.³ B62D *55/26*

U.S. Cl. 305—35 R **9 Claims**



1. In a track structure for a crawler track of a crawler vehicle wherein said structure has a substantially flat rectangular wear surface and means for fastening said structure on said crawler track, the improvement wherein said structure comprises an ultra high molecular weight polymeric material forming part of said wear surface and having a molecular weight of at least two million, and a plurality of rubber friction elements embedded in said polymeric material which serves as a matrix therefor, said elements each having an exposed surface comprising the remaining part of said wear surface, each of said rubber friction elements having a predetermined parallelepiped configuration, said exposed surface of each of said elements being a planar surface which is disposed coplanar with said first named part of said wear surface, said friction elements being disposed in spaced parallel relation to each other and each extending completely across said wear surface and crossing the longitudinal axis of said rectangular wear surface at angles other than right angles to said longitudinal axis of said rectangular wear surface.

4,390,215

BALL BEARING SLIDE UNIT FOR LINEAR MOTION

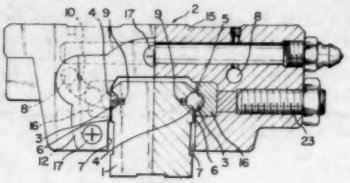
Tatsuo Mottate, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,765

Claims priority, application Japan, Apr. 10, 1981, 56-51825[U]; Apr. 14, 1981, 56-53308[U]; Jul. 17, 1981, 56-106417[U]

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **4 Claims**



4. A ball bearing slide unit for linear motion wherein said slide unit is mounted on a track rail of rectangular cross section which is provided with linear track surfaces symmetrically at the both vertical side surfaces, and is provided with track surfaces opposing said track surfaces on said track rail, with linear return holes running parallel to said track surfaces, and with direction changing paths which connect the both ends of said track surfaces and said return holes respectively, and is formed with circulating paths where groups of balls endlessly circulate supporting a load and rolling between both track surfaces, characterized in that said slide unit includes:

plastic side plates of the slide unit of ball bearing for linear motion, characterized in that said plastic side plates, are formed with direction changing paths having circular arc shape for connecting the ends of linear paths consisting of track surface which is the load zone and the return hole which is the no load zone of said circulating paths respectively, allow smooth direction change movement of the balls from the load zone to the no load zone, and are embedded with steel guide plate at the innermost peripheral surface of said direction changing paths, said steel guide plate having circular arc edge surface which is flush with said direction changing paths and being integrally molded with said plastic side plates;

track plate retainers of the slide unit of ball bearing for linear motion, characterized in that said track plate retainers, are mounted on both end surfaces of said slide unit body externally contacting both the ends of the track plates of rod shaped members having track surfaces of half cylindrical shape which are fitted symmetrically on the channel shaped inner surfaces of said slide unit body at positions opposing the track surfaces of said track rail and the ends of said return holes, are plate shaped forming part of said direction changing paths with the side plate which is further externally mounted, are formed with recess of downward facing channel shape for mounting on said track rail, said recess having resilient short claw members which are perpendicularly bent and projecting at the top ends of its both inner edges, said claw members forcing the inner ends of the track plates towards outside at immediately above the ends of the track surfaces of said track plates, are provided, at position contacting the track surface end of said track plate, with half circular shape cuts which connect to track surfaces of the load zone, thus forming part of the direction changing path, and are also provided, at position contacting the ends of said return holes, with circular holes which connect to return holes, thus forming part of direction changing path, the side surfaces of said cuts and said circular holes at the side where they contact said side plate being formed slanted so

as to form spatial circular arc shaped downward surfaces, and

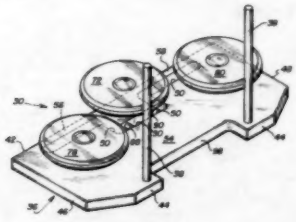
ball retainers of the slide unit of ball bearing for linear motion, characterized in that said ball retainers, are mounted on the slide unit opposing the track surface of the slide unit for preventing the groups of balls rolling linearly between the track surface of said track rail and the opposing track surface of the slide unit from falling out of the track surface of the slide unit, are made by thin metallic rod member, the cross section of which is such that the height is twice as large as its width, is made into a substantially flat channel shape in a plane, are formed to have a main member portion of straight rod shape, bent pieces bent perpendicularly from both ends thereof and hook shaped pieces at the tip of said bent pieces, and are engagingly hooked onto the side plates assembled on both ends at the direction of movement of the slide unit body through said bent pieces and said hook shaped pieces.

4,390,216

CARRIAGE HAVING INTEGRAL SPRING

Fredrick N. Mueller, and Henry C. Brown, both of Dallas, Tex., assignors to Camsco, Inc., Richardson, Tex.

Filed Sep. 16, 1981, Ser. No. 302,799
Int. Cl.³ F16C *29/00*
U.S. Cl. 308—6 R **5 Claims**



1. A carriage for slidable movement along a track having first and second parallel spaced-apart guide surfaces comprising:

a base member having first and second edges parallel to said first and second parallel spaced apart guide surfaces, said base member having an elongated slotted aperture formed therein along said first edge thereof, said aperture defining first and second portions of said base member spaced apart thereby, said first portion supported at its ends by said second portion;

first roller means mounted on said first portion of said base member for slidably engaging said first guide surface; and

second roller means mounted on said second portion of said base member for slidably engaging said second guide surface, wherein said base member forms an integral spring for compressing said first portion of said base member relative to said second portion to thereby bias said first and second roller means against said guide surfaces to maintain the carriage in said track, and for compensating for dimensional variations in said track.

4,390,217

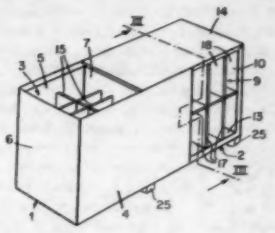
CONTAINER FOR ARTICLES OF DAILY USE, HAVING TWO ENCLOSABLE CHAMBERS

Hans-Ruedi Wagner, 25 Woodale La., Santa Barbara, Calif. 93103

Continuation-in-part of Ser. No. 140,774, filed as PCT CH79/00011, Jan. 26, 1979, published as WO79/00558, Aug. 23, 1979, § 102(e) dated Sep. 26, 1979, abandoned. This application Dec. 16, 1980, Ser. No. 216,950

Claims priority, application Switzerland, Jan. 27, 1978, 936/78

Int. Cl.³ A47B *46/00*; B65D *6/06, 43/20*
U.S. Cl. 312—205 **6 Claims**



1. A container for small articles of daily use, comprising

(I) a first container half comprising:

(a) a rectangular bottom wall having four edges, an upper face and an underside,

(b) foot means on the underside of said bottom wall and adapted for being placed on a horizontal base surface,

(c) a rectangular vertical rear end wall having a lower edge, an upper edge and two side edges, and having said lower edge rigidly connected to a first one of the edges of said bottom wall,

(d) an inner rectangular vertical wall having a lower edge, an upper edge and two side edges and being rigidly mounted with its lower edge on said upper face of said bottom wall in parallel with said rear end wall and in a position intermediate said first one of the edges of the bottom wall and the edge thereof opposite said first one edge,

(e) a rectangular top wall of equal size with said bottom wall and having an upper face, an underside, and four edges, said top wall being rigidly attached with a first one of its edges to said upper edge of said rear end wall and resting with its underside on the upper edge of said inner vertical wall, so as to extend parallel with said bottom wall, the edges of said bottom wall and of said top wall being of substantially equal length;

(f) said top wall, bottom wall, rear end wall and inner vertical wall enclosing on four sides a horizontally disposed first chamber of parallelepiped block shape, and

(g) subdividing wall means mounted inside said first chamber for dividing said first chamber into a plurality of horizontal compartments each of which has at least one open end and extends therefrom parallel with said rear end wall;

(II) a second container half comprising

(a) first and second vertically disposed rectangular longitudinal sidewalls, each sidewall having two upright edges of the same height as said rear end wall, and two longitudinal edges the length of each of which is equal with a respective parallel edge of said bottom and top walls, said longitudinal sidewalls of said second container half extending normal with regard to said rear end wall of said first container half,

(b) a vertical front end wall of equal size and configuration with said rear end wall of said first container half, having a lower edge, an upper edge and two side edges, one of said side edges being rigidly joined at right angle with a first upright edge of said first longitudinal sidewall, and the other side edge of said front end wall being ridgidly joined at right angle with a first upright edge of said second longitudinal sidewall,

(c) a rectangular vertical intermediate wall, of equal size and configuration as said inner vertical wall of said first container half, and disposed parallel with said front end wall, said intermediate wall having a top edge, a bottom edge, a first side edge and a second side edge, said first side edge thereof being rigidly mounted on the inner surface of said first longitudinal sidewall, and said second side edge thereof being rigidly mounted on the inner surface of said second longitudinal sidewall,

(d) said intermediate wall, front end wall and longitudinal sidewalls enclosing on four sides a vertically disposed second chamber of parallelepiped block shape,

(e) subdividing wall means mounted inside said second chamber for dividing said second chamber into a plurality of vertical compartments having open top ends,

(f) bottom wall means at the lower ends of said vertical compartments for closing the latter, said bottom wall means and lower ends of said vertical compartments being at a level, above the lower longitudinal edges of said longitudinal sidewalls, which level is above the level of the upper face of said bottom wall of said first container half when the underside of the said bottom wall is flush with said lower edges of said longitudinal sidewalls,

(g) said longitudinal sidewalls protruding with free sidewall ends beyond said intermediate wall which free sidewall ends are of a size sufficient to cover entirely the open ends of all of said horizontal compartments in said first chamber, and

(h) said top wall and bottom wall of said first container half protruding with free top and bottom wall ends, respectively, beyond said inner vertical wall, which free top and bottom wall ends are of sufficient size to cover entirely, respectively, the open top ends and the lower closed ends of said vertical compartments in said second chamber, when said two container halves are in closing engagement with each other; and

(III) guide means associated with longitudinal edges of said longitudinal sidewalls and of said top wall and bottom wall, said guide means of said longitudinal sidewalls being adapted for engaging the guide means of said top wall and bottom wall, respectively, for sliding displacement of said first and second container halves relative to one another.

4,390,218

COAXIAL TRANSMISSION LINE CONNECTOR

Jack L. Kruger, P.O. Box 215, Goffstown, N.H. 03045

Continuation-in-part of Ser. No. 19,325, Mar. 12, 1979, abandoned. This application Oct. 16, 1980, Ser. No. 197,474

Int. Cl.³ H01R *11/02*

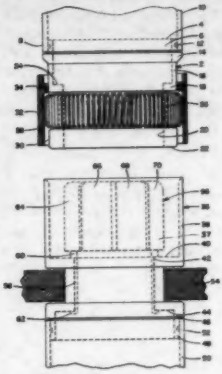
U.S. Cl. 339—9 E **12 Claims**

1. An improved connector for reducing the resistance to heat flow through the expansion joint of the inner power conductor of a coaxial transmission line, said connector comprising

a. first and second metallic cylindrical parts in which one end of said first part is positioned in telescoped relation within one end of said second part,

b. means positioned between and engaging the said telescoped ends to provide electrical continuity between said parts and to permit relative axial movement of said parts, and

c. a heat bypass member comprising a third cylindrical metallic part within the joint of said first and second parts, the exterior of one end of said third part being in continuous circular surface engagement with the circular interior



surface of the end of said first part, and the exterior of the other end of said third part being in continuous circular surface engagement with the circular interior of a section of said second part adjacent the end of said first part.

4,390,219

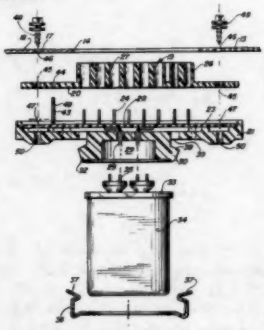
TERMINAL BLOCK AND CAPACITOR MOUNT FOR BLOWER

Richard F. Beehler, Williamson County, Tenn., assignor to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Mar. 16, 1981, Ser. No. 244,159

Int. Cl.³ H01R *4/66;* **H02K** *11/00*

U.S. Cl. 339—14 R **18 Claims**



9. An electrical connector and mount for a motor capacitor having an end wall and terminals projecting from the end wall, comprising:

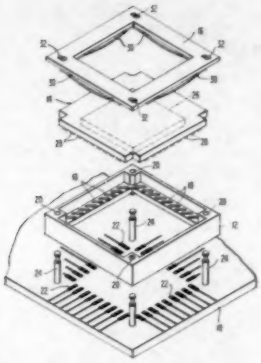
electrically insulating wall means defining an outwardly opening well, and laterally projecting securing shoulder; and

a clip having an annular force-applying portion for engaging the capacitor, and a spring portion for resiliently releasable interlocked association with said securing shoulders, said force-applying portion comprising means for urging the capacitor end wall against the wall means with the terminals thereof received in said well as a result of the spring fingers being resiliently interlocked with said securing shoulders.

4,390,220
ELECTRICAL CONNECTOR ASSEMBLY FOR AN INTEGRATED CIRCUIT PACKAGE

John E. Benasutti, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1981, Ser. No. 250,424
Int. Cl.³ H01R 13/62
U.S. Cl. 339—17 CF 9 Claims



1. A connector assembly for providing electrical circuit paths between an integrated circuit package and an interconnection medium comprising:

a housing for installing said integrated circuit package therein, said housing being comprised of at least a plurality of side members and having opposed external surfaces lying in respective parallel planes orthogonal to said side members, said housing having a plurality of apertures formed in said side members and connecting said external surfaces,

a plurality of mounting pins disposed in said interconnection medium, said mounting pins entering respective ones of said plurality of apertures at one of said external surfaces of said housing, and exiting the other of said external surfaces,

a lid including a plurality of spring members affixed to one surface thereof for applying pressure to said integrated circuit package installed in said housing, said lid having a plurality of locking slots homologously positioned with respect to said mounting pins, the application of external forces to said lid in at least the direction of said integrated circuit package causing said mounting pins to protrude through said locking slots and to be captured in the latter, said connector assembly remaining held together in unitary fashion upon the subsequent termination of said forces.

4,390,221
MODULAR CONNECTOR ASSEMBLY HAVING AN ELECTRICAL CONTACT

Paul D. Niles, Bainbridge, and Richard W. Normann, Otego, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

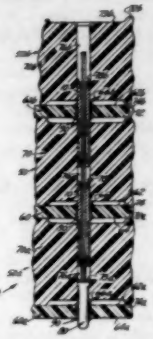
Filed Apr. 24, 1981, Ser. No. 257,023
Int. Cl.³ H05K 3/34
U.S. Cl. 339—17 M 4 Claims

1. A modular connector assembly (50) characterized by:

a printed circuit board (60) comprised of a dielectric material and having top and bottom surfaces (62, 64), a plurality of apertures (66) extending between the surfaces of the board and a circuit printed on one of the surfaces;

an interconnection device (70) mounted to the printed circuit board, the interconnection device comprised of a dielectric material and having top and bottom faces (72, 74) and a plurality of passages (76) extending therethrough arranged in a predetermined pattern; and

a contact (10) mounted within one of the passages of said interconnection device, said contact (10) being of the type comprising a holder (20) of solderable material and a

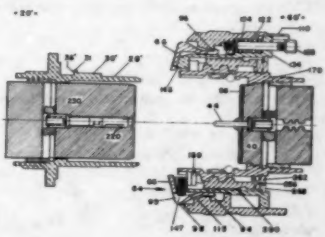


sleeve (40) comprised of stainless steel, the sleeve having one end (42) secured to the holder and another end (44) extending forwardly of the holder, the sleeve and an end portion of the holder extending through the aperture (66), the extended portion of the holder wavesoldered to the printed circuit board.

4,390,222
LANYARD RELEASE/UMBILICAL ELECTRICAL CONNECTOR

David P. E. Carter, Laguna Niguel, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Continuation of Ser. No. 81,009, Oct. 1, 1979, abandoned. This application Sep. 11, 1981, Ser. No. 301,308
Int. Cl.³ H01R 13/625, 13/633
U.S. Cl. 339—45 M 10 Claims



1. A quick-release circular electrical connector, comprising:

a. receptacle means including
a receptacle shell provided with
a receptacle barrel and
a set of electrical contacts;

b. said receptacle barrel having positioned, circumferentially, on its exterior surface a plurality of keys, each of said keys being squared at the end farthest from the nose of said barrel, and each of said squared ends being located on a common circumference around said barrel;

c. plug means including
a set of electrical contacts, and
a plug shell means comprising,
a collet,
a coupling ring means, and
a detent shell;

d. said receptacle electrical contacts and said plug electrical

contacts being capable of mating to complete an electrical circuit and unmating to break said electrical circuit;

e. said plug shell means being capable of mating/unmating said two sets of electrical contacts through an axial movement imparted by rotational movement of said coupling ring means of substantially less than one rotation, where said mating action includes placing in a locked condition said plug means and said receptacle means through cooperation of said keys and said collet;

f. said collet having a flange-lip extending radially inward from a ring member, which ring member terminates in a base,

said flange-lip defining an opening, said opening having a diameter slightly smaller than the outside diameter of said keys,

said flange-lip having keyways corresponding to said receptacle barrel keys, and

said collet being divided into a plurality of circumferential lengths,

the flange-lip portion of each circumferential length being brought into locked, abutted relation with said squared ends of said keys through said rotational movement of said coupling ring means which is imparted to said circumferential lengths, the effective flange-lip diameter being smaller than said key outside diameter during mating/locking action;

g. said coupling ring means having a ring opening portion slightly larger in diameter to enclose said collet base, and having resilient means mechanically biasing said coupling means and permitting pull back of the coupling ring means;

h. said detent shell having an element for contacting said resilient means, and a nose portion on said coupling ring for assisting said detent shell to impart rocker motion to said collet circumferential lengths; and

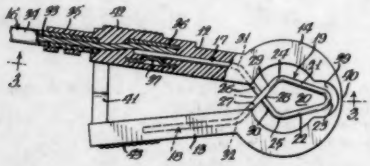
i. a quick release trigger means for withdrawing said coupling ring forcefully from contact with said ring member of said collet, thereby imparting said rocker motion to said circumferential lengths which increases the flange-lip opening diameter beyond the outside diameter of said keys to unlock said plug means from said receptacle means, and continued axial movement imparted by said trigger means unmates said plug means and said receptacle means.

4,390,223

ELECTRICAL CONNECTOR

Ilias R. Zenkich, Norridge, Ill., assignor to Zenex Corporation, Chicago, Ill.

Filed Oct. 16, 1980, Ser. No. 197,485
Int. Cl.³ H01R *13/48*
U.S. Cl. 339—61 R **6 Claims**



1. An electrical connector between a stud-provided electrode having a reduced cross-section forming a neck and a cable comprising:

a resilient wire conductor having its ends crossed to form a loop;

a pair of electrical insulating handles attached one to each of said ends and having a hinge therebetween peripheral of said loop;

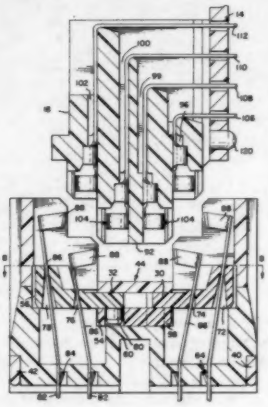
an electrical cable connected to one of said ends, whereby closure of said handles about said hinge enlarges the loop to allow the stud to pass therethrough and release of said handles causes said loop to contract about and grip said stud neck completing the electrical connection.

4,390,224

TWO PIECE ZERO INSERTION FORCE CONNECTOR

Robert L. Showman, Hershey, and Robert N. Weber, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 14, 1981, Ser. No. 263,661
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—75 MP **17 Claims**



1. A zero insertion force connector assembly for mounting daughter circuit boards on mother circuit boards comprising:

a receptacle having a housing defining an elongated cavity and a cam assembly movably mounted in a base portion of said cavity, a plurality of holes formed in said cam assembly in a patterned array, and a like plurality of first terminals mounted in said housing along at least one side of said cavity and extending through said holes in said cam assembly to be moved thereby in a direction normal to the longitudinal axis of said cavity, each said first terminal having a blade portion extending toward said cavity and a tail portion engaging said mother board; and

a plug having a housing with a mating profile receivable in said cavity, a plurality of second terminals mounted in said plug housing, each said second terminal having a pair of arms defining a blade receiving slot therebetween, whereby when said plug is received in said cavity of said receptacle said first terminals are moved by said cam assembly so that the blade portions of each first terminal lies between and in engagement with said arms of a respective second terminal.

4,390,225

FUSE BLOCK ASSEMBLY

Kevin N. Coyne, Georgetown, and Hazen Curtis, III, Andover, both of Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

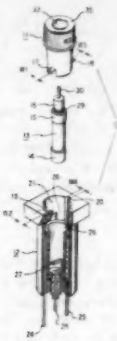
Filed Aug. 6, 1981, Ser. No. 290,664
Int. Cl.³ H01R *13/68*
U.S. Cl. 339—88 R **12 Claims**

1. In a fuse block assembly comprising a fuse block having at least one fuse receiving chamber (e.g. **21**), bus bars (e.g. **24,25**) in said fuse block each having a portion (e.g., **22** or **23**) which extends transversely into each of said chambers, electrical terminal means (e.g. **27**) within each of said chambers for contacting an end (e.g. **14**) of each inserted fuse and one removeable fuse cap (e.g. **11**) positioned in one of said cham-

bers by the engagement of first and second opposing conductive lugs (e.g. **17, 18**) with said portion of said bus bars, said fuse cap being characterized by

a housing (e.g. **31**) having an aperture extending from a first end, said aperture defining first and second protuberances (e.g. **37,39**) which extend transversely into said aperture, said first protuberance being closer to said first end, said aperture incorporating a pair of opposing recesses (e.g. **38**) adjacent said first protuberance and toward said first end, said aperture also incorporating a slot (e.g. **45**) extending from said first end completely through the housing wall;

a conductive base (e.g. **48**) having a pair of opposing tabs (e.g. **51**) which maintain the position of said base adjacent



said first protuberance by the engagement of said tabs with said opposing recesses;

a conductive spring member (e.g. **47**) attached to said base and extending within said aperture toward said first end;

a conductive fuse holder (e.g. **46**) attached to said spring member having an opening toward said first end for receiving a second end (e.g. **16**) of each inserted fuse;

a conductive first member (e.g. **52**) attached to said base and having a portion (e.g. **53**) which engages with said slot and forms said first lug; and

a conductive second member (e.g. **40**) adjacent said second protuberance and extending transversely into said aperture, said second member also extending outwardly from said housing to form said second lug.

4,390,226

ELECTRICAL PLUG FOR A RECEPTACLE HAVING A PLURALITY OF CONTACT PINS

Cletus R. Hohn, 4156 Eggers Dr., Fremont, Calif. 94536

Filed Jan. 19, 1981, Ser. No. 225,983
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—89 M **8 Claims**

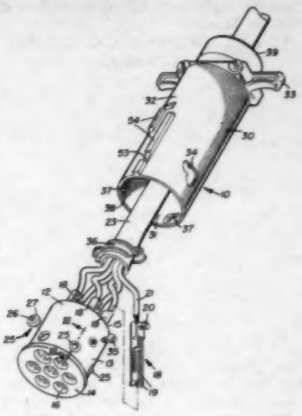
1. An electrical plug for a receptacle having a plurality of contact pins, comprising:

(a) an electrically non-conductive body having the shape generally of a right circular cylinder with a longitudinal axis and having a plurality of longitudinally aligned orifices therein;

(b) a plurality of socket contact assemblies received in said orifices, said assemblies each being resiliently deformable and each connectable to an electrical conductor;

(c) a shield which houses said body and said socket contact assemblies having an annular shape with an inner side wall, said body and said shield being relatively movable with respect to each other, said inner side wall of said shield having a cam surface thereon defining a depression of varying depth, and

(d) a plurality of followers radially received in said body and engaged by said cam surface of said shield to deform said resilient contact assemblies against said contact pins of



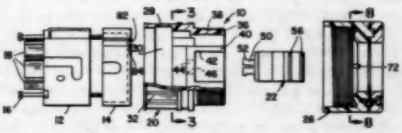
said receptacle a variable amount depending on the relative position of said shield and said body.

4,390,227

CORD GRIP FOR ELECTRICAL WIRING CONNECTOR DEVICES

Peter C. Deutsch, Novato, Calif., assignor to Marine Industries Company, Ignacio, Calif.

Filed Dec. 8, 1980, Ser. No. 214,254
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—103 C **8 Claims**



1. A cord grip assembly for an electrical wiring device, said assembly comprising:

a housing member having an opening therein for receiving an electrical cord;

a plurality of separate, flexible finger elements, each being removably secured to said housing member about said opening and extending generally parallel to its longitudinal axis, each said element having an inner end portion with means for latching it in said housing member and an outer end portion for engaging said cord;

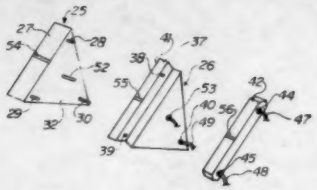
end cover means for engaging said housing member having an opening for receiving said cord;

internal means in said cover means forming a shoulder effective to engage said finger elements and to force them together inwardly to grip said cord when said cover means is moved relative to said housing member.

4,390,228
VEHICLE/TRAILER LIGHTING CONNECTOR APPARATUS

Clifford E. Schleusner, Billings, Mont., assignor to Bruce Haagenson, Billings, Mont.

Filed May 28, 1981, Ser. No. 267,684
Int. Cl.³ H01R 33/76
U.S. Cl. 339—113 R 10 Claims



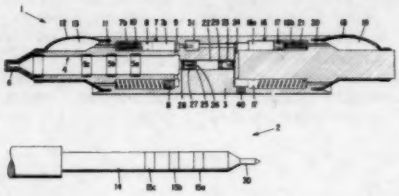
1. Vehicle/trailer lighting connector apparatus including a first connector portion and a second connector portion engageable with said first connector portion; said first connector portion including a first base section, at least three primary connector members associated with a major face of said first base section, electrical lead wires with an end of one of said wires affixed to each of said primary connector members at a point thereon remote from said major face of said first base section, three of said primary connector members being arranged in an equilateral triangular configuration; said second connector portion including a second base section, at least three secondary connector members associated with a major face of said second base section, three of said secondary connector members being disposed in a triangular configuration with the arrangement of said secondary connector members corresponding to the arrangement of said primary connector members of said first connector portion, each of said primary connector members of said first connector portion being engageable with one of said secondary connector members of said second connector portion, said second connector portion including a section separable from said second base section, said separable section including two spaced connector members engageable with two of said secondary connector members of said second connector portion at points remote from said major face of said second base section, two electrical lead wires with an end of one of said wires affixed to each of said spaced connector members of said separable section of said second connector portion at a point thereon remote from the surface of said separable section adjoining said second base section of said second connector portion, an electrical lead wire having one end affixed to said secondary connector member of said second base section spaced from said separable section at a point on said connector member remote from said major face of said second base section; whereby connecting said separable section with said second base section in one of two reversible positions and rotating the connection of said first connector portion with respect to said second connector portion provides coordinated operation of vehicle lighting with lighting of a trailer attached to said vehicle.

4,390,229
PLUG-IN CONNECTOR SUITABLE FOR USE IN A FLUID MEDIUM

Andre Chevalier, Pantin, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 23, 1981, Ser. No. 237,213
Claims priority, application France, Feb. 22, 1980, 80 04028
Int. Cl.³ H01R 13/44, 13/52
U.S. Cl. 339—115 R 10 Claims

1. A plug-in connector adapted for use in a fluid medium, comprising a socket having at least one bore; a plug provided with at least one pin for mating within said bore; a main chamber communicating with said bore and containing a protecting product and making up an assembly with said at least one bore, and the volume of said main chamber being automatically variable for filling said bore with protecting product as the pin is withdrawn from the bore; and said connector further comprising a compensation chamber filled with said protecting

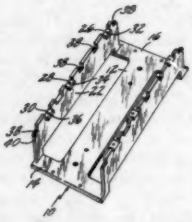


product under a pressure higher than that prevailing in said main chamber; and transfer means adapted for transferring a predetermined amount of said protecting product from said compensation chamber to said assembly formed by said main chamber and said bore of the socket to compensate for protecting product loss upon removal of said plug from said bore.

4,390,230
MODULAR BLOCK BASE AND BRACKET ASSEMBLY

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Jan. 11, 1980, Ser. No. 111,311
Int. Cl.³ H01R 9/02
U.S. Cl. 339—125 R 9 Claims



1. A mounting bracket for terminal blocks, the bracket including:

a rear mounting surface;

a pair of spaced apart side walls extending from said mounting surface;

three recesses in the top surface of each of said side walls, said recesses in each side wall being spaced apart unequally;

three inwardly projecting tabs on each of said side walls; and

a plurality of notches in each of said side walls, each of said notches terminating in a bevelled surface on the inner surface of the side wall.

4,390,231
BLADE TERMINAL WITH PROTECTED LATCH TANGS

Robert G. Plyler, Vienna, and Lyle B. Suverison, Fowler, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 919,765, Jun. 28, 1978. This application Nov. 13, 1978, Ser. No. 960,490
Int. Cl.³ H01R 13/432
U.S. Cl. 339—217 S 4 Claims

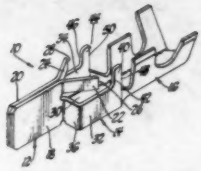
1. A terminal having protected latch tang means for latching the terminal in a connector body comprising:

a forward contact portion comprising a pair of separate longitudinal blades,

an enlarged channel shaped median portion having a web and side walls of reduced width connected to respective ones of the separate longitudinal blades by separate transition portions,

a pair of longitudinal inclined latch tangs attached to the respective rearward edges of the longitudinal blades and diverging away from each other in the rearward direction,

said pair of inclined latch tangs being adjacent the channel shaped median portion at a side opposite the web,



each of said inclined latch tangs being entirely within the outline of an adjacent side wall and connecting transition portion,

a lateral extension on each side wall spaced rearwardly of the latch tangs, each lateral extension having a portion behind and in longitudinal alignment with one of the latch tangs, and

an attachment portion attached to the web in an offset position with respect to the forward contact portion.

4,390,232

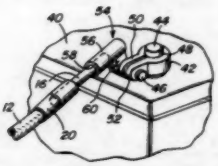
MAGNETIC ELECTRICAL CONNECTOR

George H. Jamgotchian, 2769 West Mesa, Fresno, Calif. 93711

Filed Aug. 27, 1980, Ser. No. 181,688

Int. Cl.³ H01R *11/11*

U.S. Cl. 339—224 **11 Claims**



10. An electrical connection means, said electrical connection means comprising:

an electrical energy supply means;

conductor means attachable to said electrical energy supply means for conducting electrical energy to and from said supply means;

magnetic connection means positionable between said electrical energy supply means and said conductor means for facilitating a connection between said conductor means and said supply means;

connector means fixedly secured to said conductor means and being magnetically attachable to said magnetic connection means; and

terminal connector means secured to said supply means and being magnetically attachable to said magnetic connection means, spring retention means provided on said connector means so as to provide an improved connection between said magnetic connection means and said connector means.

4,390,233

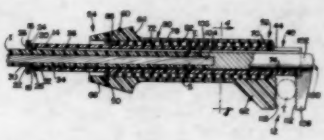
BATTERY CABLE CONNECTOR

David E. B. Sanders, Jr., 3743 Kayanne Ct., Tucker, Ga. 30084

Filed Apr. 21, 1981, Ser. No. 256,142

Int. Cl.³ H01R *11/22, 11/24*

U.S. Cl. 339—255 R **3 Claims**



1. A connector for connecting an electrical cable to a terminal comprising:

a non-conductive sheath attached at a first end thereof to an electrical cable to surround that cable and extend at another end thereof beyond the end of that cable, said first sheath end having screw threads defined therein, an elongate slot defined therein at said another end, and a projection located near said sheath first end;

a jam nut connecting said first end of said non-conductive sheath to said cable, said jam nut including a bore which receives said cable and external threads which cooperate with said sheath threads;

an electrically conductive jaw portion electrically and fixedly connected to the electrical cable, said jaw portion having a body located within said non-conductive sheath;

a non-conductive sleeve telescopingly mounted on said sheath, said sleeve including a lip on one end and a boss on another end, said lip being located within said sheath slot, said sleeve and said sheath being spaced apart to define an annulus;

a non-conductive jaw movable portion on said sleeve and in facing opposition to said electrically conductive jaw portion;

yieldable spring means located in said annulus and having one end seated against said sheath projection and another end seated against said sleeve lip to connect said sleeve to said sheath, said sleeve being movable with respect to the cable mounted sheath whereby a terminal is grasped between said jaw portions to electrically connect that terminal to the cable via said conductive jaw portion; and

a set screw in said sleeve boss, said set screw abutting said sheath projection on a side of that projection opposite to the side therof on which is seated said spring one end, said set screw preventing said sleeve from separating from said sheath.

4,390,234

VIEWER/PROJECTOR FOR DISPLAY OF 360 DEGREE HOLOGRAPHIC FILM CASSETTES

James T. Embach, 760 Knollwood Ct., Saline, Mich. 48176

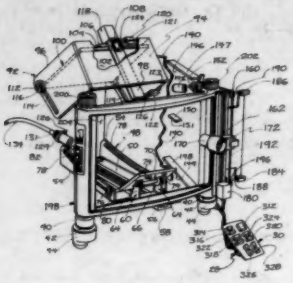
Filed Aug. 14, 1980, Ser. No. 177,943

Int. Cl.³ G03H *1/02, 1/22*

U.S. Cl. 350—3.65 **16 Claims**

1. A cassette for storage, handling and display of holographic film prerecorded in an arcuate film configuration at least partially surrounding the recorded object at a prespecified fixed radius, said cassette comprising first and second film spools, a length of said holographic film extending between said film spools, and a frame including spaced end portions mounting said spools for free rotation about spaced parallel axes on a common plane and a central portion affixed to and rigidly extending between said end portions on one side of said plane, said central portion including first means providing an arcuate film path extending between said spools at a fixed uniform radius of curvature equal to said prespecified radius,

with said radius of curvature being centered on a side of said plane opposite said path, and second means providing a



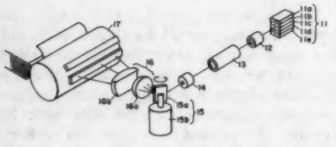
through window for illumination of film extending between said spools from a direction transverse to said path.

4,390,235

MULTIBEAM SCANNING APPARATUS PROVIDED WITH A FUNCTION OF CHANGING MAGNIFICATION

Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 301,015
Claims priority, application Japan, Sep. 18, 1980, 55-130240
Int. Cl.³ G02B 27/17
U.S. Cl. 350—6.1 3 Claims



1. A scanning apparatus for scanning a surface with a plural number of beam spots independently modulated at the same time, said apparatus comprising:

a light source for producing a plural number of light beams that are independently collimated;

a deflector having at least one reflecting surface for deflecting said light beams from said light source part in selected directions;

an afocal magnification changing optical system disposed between said light source part and said deflector for changing the angular magnification of said collimated beams;

a first anamorphic optical system disposed between said magnification changing optical system and said deflector for focusing on said reflecting surface of said deflector the components of said light beams which are normal to the deflection scan plane that the light beams deflected by said deflector define with time; and

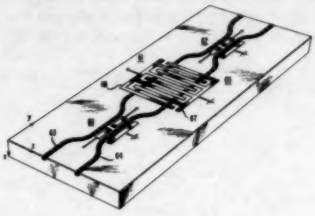
a second anamorphic optical system for maintaining said reflecting surface of said deflector and said scanned surface in an optically conjugated relation with each other in a plane normal to said deflection scan plane and for focusing said light beams deflected by said deflector on said scanned surface.

4,390,236

TUNABLE POLARIZATION INDEPENDENT WAVELENGTH FILTER

Rodney C. Alferness, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 19, 1981, Ser. No. 245,626
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.14 5 Claims



1. A wavelength filter (10) comprising:

an input polarization selective coupler (11) for separating, in two different wavepaths (12, 13), orthogonally polarized wave components (TE, TM) of an arbitrarily polarized input signal;

a wavelength selective (TE⇄TM) mode converter (14, 15) located in each of said wavepaths (12, 13);

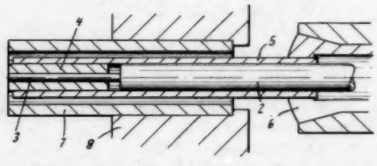
and an output polarization selective coupler (16) for combining in one output signal path (17) signal components centered about the wavelength of said mode converters, and for combining in a second output wavepath (18) the balance of said input signal.

4,390,237

COUPLING ASSEMBLY FOR LIGHT WAVE CONDUCTORS AND METHOD FOR THE PRODUCTION THEREOF

Silvio Marazzi, Cavigliano, Switzerland, assignor to Diamond S.A., Losone, Switzerland

Filed Aug. 14, 1980, Ser. No. 177,881
Claims priority, application Switzerland, Aug. 15, 1979, 7467/79
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 8 Claims



1. A method of producing a coupling assembly for light-wave conductors, comprising

fitting an end portion of a light-wave conductor into a capillary tube so that the end thereof projects from the capillary tube and fitting the capillary tube into a holder tube so that the end of the capillary tube projects from the holder tube, and securing the conductor end portion and the capillary and holding tubes together,

grinding a flat end face on the conductor at right angles to its axis, and

positioning the holder tube within a centering sleeve in a first position with the flat end face of the conductor in transverse alignment with an end face of the centering sleeve, and with the conductor and centering sleeve in axial alignment, and then withdrawing the holder tube

within the centering sleeve to a second position to recess the flat end face of the light-wave conductor a distance inwardly from the centering tube end face and connecting the holder tube to the centering sleeve in the second position.

4,390,238

OPTICAL TELECOMMUNICATION ELEMENT, METHOD OF MANUFACTURING SAME, AND OPTICAL TELECOMMUNICATION CABLE COMPRISING THE ELEMENT

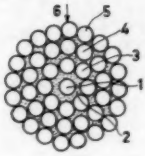
Willem Van Der Hoek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,619

Claims priority, application Netherlands, Dec. 13, 1979, 7908966

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.23 **11 Claims**



1. An optical telecommunication element comprising:
a central optical fiber;
a layer of a cured lacquer surrounding the optical fiber and in contact therewith; and
a close-fitting sheath of reinforcement fibers in the layer of cured lacquer, said reinforcement fibers having a minimum elasticity modulus of 4,000 kg/mm², said sheath being spaced from the central optical fiber by a thin sublayer of cured lacquer which fixes the optical fiber axially and radially within the sheath, said sheath and lacquer fixing the optical fiber under axial compression.

4,390,239

PROJECTION SCREEN

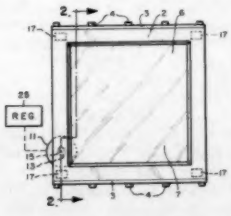
Erich Huber, Schönberg, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 262,992

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018449

Int. Cl.³ G03B 21/56

U.S. Cl. 350—120 **28 Claims**



1. In a projection system of a type wherein a light image is projected for viewing on a diffusion plate, the improvement comprising:
a projection lens positioned adjacent and in close proximity to said diffusion plate, said projection lens comprising a plurality of lenticular elements; and
means for providing relative lateral movement between said projection lens and said diffusion plate to eliminate polychromatic shimmer of the image.

4,390,240

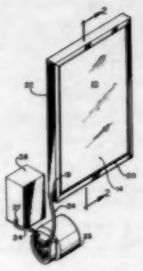
WINDOW MIRROR

Carl Bookbinder, 330 S. 17th St., Philadelphia, Pa. 19103

Filed Mar. 26, 1981, Ser. No. 247,860

Int. Cl.³ G02B 5/24

U.S. Cl. 350—258 **7 Claims**



1. A window controllably operable as a light transmitting window and as a mirror, the window comprising:
at least two substantially rigid flat panes, the panes being at least partly light transmissive;
a spacer disposed between the panes, the spacer and panes defining a vacuum-tight cavity;
a reservoir disposed below the cavity and in liquid communication with a lower part of the vacuum-tight cavity, whereby a liquid placed in the cavity will be drawn by gravity toward the reservoir;
a charge of mercury to be controllably moved between the reservoir and the cavity, a vacuum remaining in the cavity when the mercury is moved to the reservoir, whereby the window is made light transmitting; and,
a pump for moving the mercury from the reservoir to the cavity, whereby the window is made reflective.

4,390,241

REFLECTIVE TROUGH STRUCTURE

John M. Trihey, Ringwood, Australia, assignor to Vulcan Australia Limited, Victoria, Australia

Division of Ser. No. 953,771, Oct. 19, 1978, Pat. No. 4,304,221, and Ser. No. 122,054, Feb. 15, 1980, Pat. No. 4,321,909, each is a continuation-in-part of Ser. No. 883,313, Mar. 3, 1978, Pat. No. 4,324,225, which is a continuation-in-part of Ser. No. 704,674, Jul. 12, 1976, Pat. No. 4,089,323. This application Dec. 7, 1981, Ser. No. 327,909

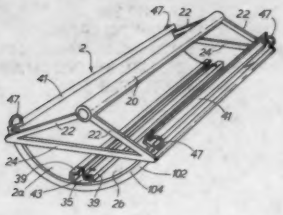
Claims priority, application Australia, Jul. 11, 1975, PC2334/75; Apr. 21, 1977, PC9839/77; Feb. 23, 1979, PD7808/79; Aug. 23, 1979, PE0157/79; Aug. 23, 1979, PE0158/79; Aug. 23, 1979, 0159/79

Int. Cl.³ G20B 5/10; F23J 3/02

U.S. Cl. 350—296 **11 Claims**

1. A trough comprising a plurality of ribs each having a concave edge and means to hold the ribs in fixed position relative to one another so that said edges lie on a common surface, and resilient sheet material one side of which is resiliently constrained into engagement with said edges and the other side of the sheet material being reflective to thereby form a reflective trough characterized said sheet material is formed with integral flanges on its lateral edges, each flange each having a first leg which is generally normal to the sheet material and a second leg which projects outwardly from the top of the first leg, and force distributing members comprising chan-

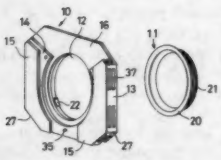
nel members and wherein the outer edges of said second legs are received within said channel members, resilient forces being applied to the channel members to resiliently bias the sheet material into intimate contact with said ribs.



4,390,242
DETACHABLE CAMERA FILTER HOLDER CAPABLE OF BEING CONNECTED IN SERIES WITH A LIKE FILTER HOLDER

Kazutsune Tatsumi, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,211
Claims priority, application Japan, Mar. 26, 1980, 55-38710
Int. Cl.³ G02B 7/00
U.S. Cl. 350—318 5 Claims



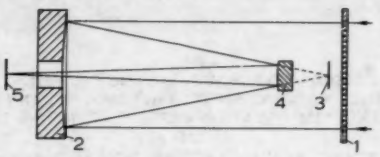
1. A filter holder comprising: a holder body having an aperture therein; an adapter ring for mounting said holder body on a lens of a camera; a plurality of apertured parallel plates rigidly coupled to said holder body, said plates and said holder body defining a first groove extending up and down and a second groove having a stop member at a low portion thereof; right and left side walls coupling said parallel plates to said holder body; leaf springs provided in said first and second grooves for resiliently supporting end surfaces of a filter; a cylindrical portion provided on a rear side surface of said holder body, said cylindrical portion having a greater radius than apertures of said plates; and a plurality of claws for resiliently retaining a flange of said adapter ring at an inner periphery of said cylindrical portion for rotatably, detachably and attachably mounting said adapter ring to said holder body.

4,390,243
APERTURE SCREEN FOR THE OBSERVATION OF BRIGHT OBJECTS WITH PRESERVATION OF THE RESOLUTION

Robert H. Hammerschlag, Albert Cuyplaan 35, 3723 GK Bilthoven, Netherlands

Filed Oct. 17, 1980, Ser. No. 198,121
Int. Cl.³ G02B 5/00
U.S. Cl. 350—319 1 Claim

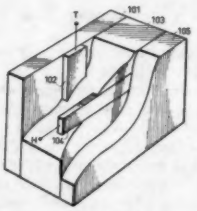
1. An optical focusing assembly comprised of focusing optics and a plate made of an opaque material in series along an optical axis, said plate including a multiplicity of holes spaced apart about 42 μm or less, said holes extending substantially across the full aperture of said focusing optics and sized so that a substantial portion of a light beam incident along said optical axis on said plate will not pass through said plate to said focusing optics, whereby an image of reduced intensity but full resolution is achieved.



4,390,244
LIQUID CRYSTAL VISUAL DISPLAY UNIT AND TELEPHONE TERMINAL INCORPORATING SUCH A UNIT

Michel Hareng; Serge Le Berre; Pierre Leclerc, and Jean Noël Perbet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 23, 1980, Ser. No. 171,408
Claims priority, application France, Jul. 27, 1979, 79 19426
Int. Cl.³ G02F 1/13
U.S. Cl. 350—333 12 Claims



1. A liquid crystal visual display unit of the type incorporating a liquid crystal layer which can be inscribed by the thermoelectric effect and incorporated between two plates, whereof at least one is transparent, a system of resistive lines located between one of the plates and the liquid crystal layer and making it possible to heat the liquid crystal at least up to its erasure temperature successively in accordance with each of the lines and a system of columns located between the other plate and the liquid crystal layer intersecting with the lines and making it possible to apply to the whole of this layer during the cooling of a line an electric field representing the information to be inscribed along the cooling line, wherein the thermal diffusivity of the plate supporting the resistive lines is below a value making it possible to obtain a unit which can be observed with the naked eye.

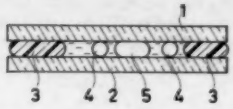
4,390,245
OPTICAL DISPLAY CELL OF EVEN THICKNESS USING ADHESIVE MEANS AND SEPARATE ADHESIVE-FREE SPACERS

Keiichiro Shimizu, Nara, and Wataru Horii, Yokohama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1980, Ser. No. 169,387
Claims priority, application Japan, Jul. 19, 1979, 54-91847
Int. Cl.³ G02F 1/13
U.S. Cl. 350—343 17 Claims

1. An optical display cell comprising:
a pair of substrate means at least one of which is transparent;
sealing means provided for sealing the pair of substrate means by joining the peripheral portions thereof;

adhering means provided for bonding portions of the pair of substrate means inboard of the sealing means; and



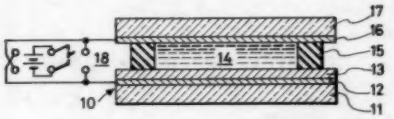
adhesive-free spacer means randomly disposed between said pair of substrate means for maintaining an approximately uniform distance between said pair of substrate means.

4,390,246

ELECTROCHROMIC DEVICE BY OBLIQUE EVAPORATION TO IMPROVE THE RESPONSE OF COLORATION AND BLEACHING

Taisuke Miyoshi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Oct. 23, 1978, Ser. No. 953,596
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **14 Claims**



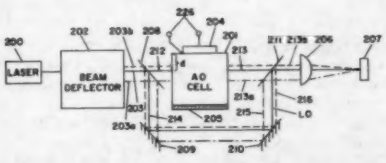
1. In an electrochromic device of the type having a substrate, a first electrode disposed on the substrate, a layer of electrochromic material disposed on the first electrode, an electrolyte disposed on the layer of electrochromic material, and a second electrode disposed on the electrolyte, the improvement comprising: said layer of electrochromic material having anisotropic topography formed by depositing by evaporation said electrochromic material such that the direction of evaporation makes an acute angle with respect to the normal to said substrate.

4,390,247

CONTINUOUSLY VARIABLE DELAY LINE

Frederick W. Freyre, Wantagh, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,561
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **14 Claims**



1. An apparatus for delaying a signal by a selected amount comprising:

first means for converting a supplied signal into at least one corresponding acoustic wave propagating through a medium;

second means for modulating a light beam with said acoustic wave at a given position in the medium;

third means for detecting the modulation components of said light beam, thereby developing an output signal which corresponds to said supplied signal, but delayed with respect thereto; and

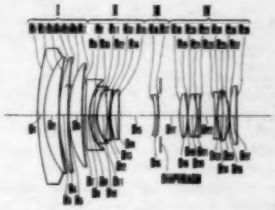
fourth means for adjusting the location of the given position in the medium, thereby to control the amount of said delay.

4,390,248

WIDE ANGLE ZOOM LENS

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,560
Claims priority, application Japan, Sep. 27, 1979, 54-124544; Dec. 7, 1979, 54-158950
Int. Cl.³ G02B 15/18
U.S. Cl. 350—427 **5 Claims**



1. A wide angle zoom lens comprising:

a first lens group of a positive refractive power stationary during zooming but movable for focusing and consisting of four elements forming three members, said members being from front to rear, a cemented lens and two positive lenses, each of said three members being in the meniscus form of convex curvature toward the front, and said cemented lens being almost afocal with its cemented surface being divergent and convex toward the front;

a second lens group of a negative refractive power movable for changing the magnification and consisting of four elements, said members being from front to rear, two negative meniscus lenses of forward convexity, a bi-concave negative lens and a positive lens, said bi-concave negative lens and said positive lens defining an air spacing having a converging action;

a third lens group movable for maintaining a constant image plane as said second group moves to effect a change in magnification; and

a fourth lens group positioned in the rear of said third group to be stationary during zooming; wherein

$$|1/f_{21}| > |1/f_{22}|$$

$$|1/f_{21}| > |1/f_{23}|$$

where f_{21}, f_{22} and f_{23} are the focal lengths of the first, second and third negative lenses counting from the front respectively in said second group.

4,390,249

GALILEAN-TYPE TELESCOPE SYSTEM

Mikhail M. Rusinov, naberezhnaya Fontanki, 139, kv. 36; Galina N. Judova, ulitsa Avtovskaya, 2, kv. 5; Jury V. Kudryashov, prospekt Piskarevsky, 39, kv. 34, and Peisakh Y. Agurok, Grozhdansky prospekt,130, korpus 4, kv. 8, all of Leningrad, U.S.S.R.

Filed Oct. 16, 1980, Ser. No. 197,758
Int. Cl.³ G02B 23/00, 9/12
U.S. Cl. 350—453 **8 Claims**

1. A Galilean-type telescope system having an object side and an eye side, comprising:

first, second and third optical components arranged succes-

sively along the optical axis of said system in the direction of the travel of the light beam therethrough,

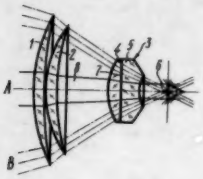
said first component being a single positive meniscus,

said second component being a single positive meniscus, and

said third component being a negative concentric meniscus,

said first and said second components constituting an objective of said telescope system and said third component being an eyepiece of said telescope system,

all said three components being concave towards the eye side of said optical system,



said negative concentric meniscus, representing said third component, including a lens member having cemented together two lenses with the same shape of cemented surfaces,

said lenses of said third component having substantially equal refractive indices but different dispersion, the dispersion of the lens disposed closer to said eye side of said telescope system being substantially less than that of the following lens, and

an air space separating said second component from said third component and whose thickness in the optical axis complies with the following relationship:

$$d_x = f_1\left(1 - \frac{1}{\Gamma}\right) - R_x,$$

wherein:

d_x—thickness of the air space in the optical axis of said system,

f_1—rare focal distance of said objective of said system,

Γ—magnification provided by said system;

R_x—radius of curvature of the front refractive surface of said negative concentric meniscus.

4,390,250

PHOTOGRAPHIC LENS SYSTEM

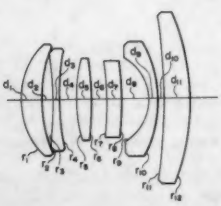
Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,460

Claims priority, application Japan, Jul. 17, 1980, 55-97782

Int. Cl.³ G02B 9/60, 9/62

U.S. Cl. 350—465 **12 Claims**



1. A photographic lens system comprising a first lens component of a positive meniscus lens with its convex surface on the object side, a second lens component of biconcave lens, a third lens component consisting of a biconvex lens and a small power positive or negative lens located adjacent the biconcave lens with an air space and having a positive refracting power as a whole, a fourth lens component of a negative meniscus lens with tis convex surface on the image side, and a fifth lens component of a positive meniscus lens with a convex surface on the image side, said lens system satisfying the following conditions:

$$1.2 < f/f_{123} < 1.8 \quad (1)$$

$$-1.3 < f/f_{45} < -0.35 \quad (2)$$

$$0.16 < d_{567}/f < 0.23 \quad (3)$$

$$0.09 < d_8/f < 0.14 \quad (4)$$

wherein the reference symbol f_{123} represents the composite focal length of the first, second and third lens components, the symbol f_{45} represents the composite focal length of the fourth and fifth lens component, the symbol d_{567} represents the length $(d_5+d_6+d_7)$ from the object side surface to the image side surface of the third lens component, the symbol d_8 represents the axial air space between the third and fourth lens components, and the symbol f represents the focal length of the entire lens system.

4,390,251

PHOTOGRAPHIC OBJECTIVES OF RELATIVELY LARGE APERTURE

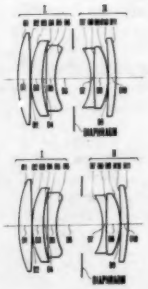
Masatake Kato, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,331

Claims priority, application Japan, Sep. 3, 1980, 55-122185

Int. Cl.³ G02B 9/60

U.S. Cl. 350—467 **1 Claim**



1. An objective lens of large relative aperture comprising:

from front to rear, a first lens group having a positive refractive power and having a positive lens with its front surface convex toward the front, a positive meniscus lens of forward convexity and a negative meniscus lens of rearward concavity, and a second lens group having a positive refractive power and having a cemented lens and a positive lens, said cemented lens including a negative lens and a positive lens,

said lenses being arranged so that when focusing is effected from an infintely distant object to a close object each of said lens groups is moved axially forward while the air separation between said lens groups is widened,

taking the focal length of the entire system as unity, and letting Ri denote the radius of curvature of the i-th lens surface counting from the front, Di the i-th thickness and air separation counting from the front, and Ni and Vi the refractive index and Abbe number of the glass material of

the i-th lens element counting from the front respectively, the conditions:

$1.60<N1<1.72$

$1.59<N3<1.65$

$48<(V_1+V_2+V_3)/3<52$

$R2<0$

$0.26<|R7|<0.30;\ R7<0$

$0.08<D7+D8<0.11$

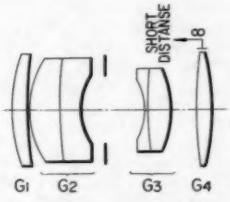
are satisfied.

4,390,252

GAUSS TYPE PHOTOGRAPHIC LENS

Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 171,003
Claims priority, application Japan, Aug. 10, 1979, 54-101976
Int. Cl.³ G02B *9/36*
U.S. Cl. 350—471 **5 Claims**



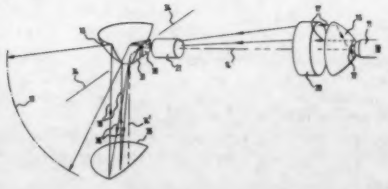
1. A Gauss type photographic lens comprising, in succession from the object side, a first group including a positive lens component, a second group including a positive lens and a negative lens and having a negative refractive power as a whole, a third group including a meniscus lens component comprising a negative lens and a positive lens cemented together and having its concave surface facing the object side, and a fourth group including a positive lens component comprising a biconvex positive lens and a negative meniscus lens having its convex surface facing the image side, focusing being effected by movement along the optical axis of either both said biconvex positive lens and said negative meniscus lens or by movement of only said biconvex positive lens.

4,390,253

PITCH AND ROLL MOTION OPTICAL SYSTEM FOR WIDE ANGLE DISPLAY

Daniel R. Lobb, Chislehurst, England, assignor to Redifon Simulation Limited, Sussex, England

Filed Jul. 14, 1981, Ser. No. 283,141
Int. Cl.³ G02B *17/08, 27/18;* G03B *21/28;* G09B *9/08*
U.S. Cl. 350—505 **5 Claims**



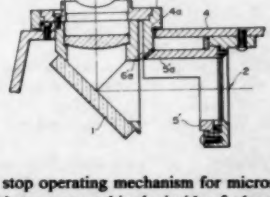
1. Optical apparatus for receiving radiation from a wide-angle input field, and transmitting the radiation into a wide-angle output field, said transmission being such that the output field is an image of the input field formed substantially at unit magnification, and for providing rotation at the output field with respect to the input field, said optical apparatus comprising a concave axially-symmetric aspheric mirror and a convex axially-symmetric aspheric mirror having complementary reflecting surface shapes, approximately paraboloids, at the foci of which the entrance and exit pupils of the system are located, and an optical system in the radiation path between the two mirrors comprising reflecting prisms and two imaging systems of equal focal length and complementary distortion located such that their inner focal surfaces coincide at an intermediate pupil image and their outer focal surfaces are respectively near the two aspheric mirrors such that the surfaces of the two aspheric mirrors are imaged one onto the other at substantially unit magnification and without distortion, the optical axes of the two aspheric mirrors and of all elements of the two imaging systems being imaged onto a common line by reflection in the reflecting prisms, the reflecting prisms being rotatable provide deflection of reflected radiation and of the optical axes of elements in the path of reflected radiation, so that radiation received from an input field at a first of the two aspheric mirrors is transmitted to the second of the two aspheric mirrors and reflected from it into an output field formed substantially at unit magnification and so that the output field is rotatable with respect to the input field.

4,390,254

FIELD STOP OPERATING MECHANISM FOR MICROSCOPES

Makoto Yoshinaga, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1980, Ser. No. 204,904
Claims priority, application Japan, Nov. 13, 1979, 54-157344[U]
Int. Cl.³ G02B *21/06*
U.S. Cl. 350—523 **2 Claims**

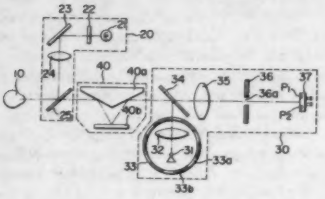


1. A field stop operating mechanism for microscopes comprising a field stop arranged in the inside of a base of a microscope, a window lens means attached to said base to restrict the light passed through said field stop, a reflecting mirror located between said field stop and window lens means in the inside of said base to deflect the optical axis, a rotating ring arranged adjacent to said field stop to open and stop down said field stop, and an operating ring rotatably mounted around said window lens means and operatively connected with said rotating ring to rotate said rotating ring.

4,390,255
EYE-REFRACTOMETER DEVICE

Masao Nohda, Yokohama; Izumi Umemura, Kawasaki, and Toshiyuki Arai, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 104,834, Dec. 18, 1979, abandoned. This application May 6, 1982, Ser. No. 375,677
Claims priority, application Japan, Dec. 22, 1978, 53/158846
Int. Cl.³ A61B 3/10
U.S. Cl. 351—212 5 Claims



1. An eye-refractometer device for measuring the refractive power of an eye to be examined comprising:

a first beam splitter;

a second beam splitter disposed on that side of said first beam splitter which is adjacent to the eye;

a projection optical system provided in one light path of said first beam splitter for projecting a slit-like light beam into the pupil of an eye to be examined by way of said first beam splitter and scanning said slit-like light beam in a direction perpendicular to the lengthwise direction of said slit-like beam;

a condenser optical system provided in the other light path of said first beam splitter for receiving the reflected light from the retina of said eye by way of said first beam splitter, said condenser optical system including a fixed condenser lens, a diaphragm member fixedly disposed substantially at a focus position of said condenser lens, and a light-receiving member fixedly disposed rearwardly of said diaphragm member, said diaphragm member having a slit-like opening parallel to the lengthwise direction of said projected slit-like beam, and said light receiving member having two light-receiving elements fixedly disposed off the optic axis of said condenser lens and symmetrical with respect to the optic axis in a direction coincident with the scanning direction of said slit-like beam;

a signal processing system for processing the signal from said light-receiving member and having phase difference detecting means for detecting the phase difference between the output signals from said two light-receiving elements and having averaging means for generating the average value signal of the plurality of signals from said phase difference detecting means;

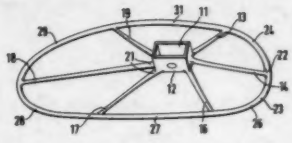
a target optical system for directing the target light to the eye by way of said second beam splitter; and

light beam rotating means disposed between said first beam splitter and said second beam splitter for rotating said light beam about the center of the light path, whereby the scanning direction of the slit-like light beam supplied by said projection optical system is rotated at the eye by means of said light beam rotating means, while the scanning direction of the slit-like beam which is reflected by the fundus of the eye, passes again through said light beam rotating means and reaches said condenser optical system, is kept constant without being subject to the rotation by said light beam rotating means, and whereby all members constituting said condenser optical system are kept fixed and no servo system is needed, thus precise and quick refractive power of the eye being measured.

4,390,256
PAD OF HIGH ELASTICITY

Walter Bononi, Zeppelinstrasse 9, 7012 Fellbach-Schmiden, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 243,795
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010735
Int. Cl.³ G03B 3/00, 29/00, 19/18
U.S. Cl. 351—139 8 Claims



1. A pad of high elasticity for eyeglass frames having pad levers which attach the pads to the eyeglass frames,

said pad having

a thin, kidney-shaped outer edge portion,

a soft, pliant front side, for contacting the eyeglass wearer,

a back, and

stable means on said back for receiving a pad lever,

wherein the improvement comprises:

thin, flexible members radiating integrally from said stable receiving means, having outer ends terminating at said kidney-shaped outer edge portion,

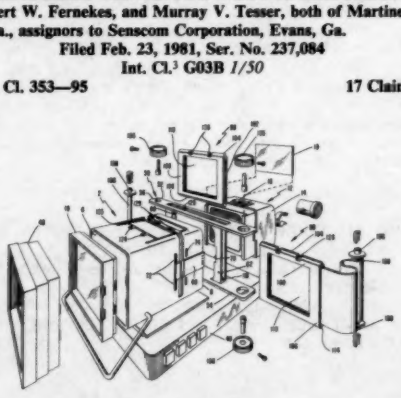
a foil-like membrane having an outer edge portion and a convex surface according to the shape of the front contact side of the pad,

said kidney-shaped outer edge portion having an outer area to receive said membrane and said membrane having a curved surface at its outer edge portion which engages with said outer area on said kidney-shaped outer edge portion.

4,390,257
HAND HELD VIEWER FOR VARIOUS SIZE FILMS

Robert W. Fernekes, and Murray V. Tesser, both of Martinez, Ga., assignors to Senscom Corporation, Evans, Ga.

Filed Feb. 23, 1981, Ser. No. 237,084
Int. Cl.³ G03B 1/50
U.S. Cl. 353—95 17 Claims



1. A hand-held filmstrip viewer comprising:

(a) a case defining a light path, said case including a slot which is in a plane perpendicular to said light path and is open on three sides of said case;

(b) means for introducing light to one end of said light path;

(c) means for viewing said light at the other end of said light path;

(d) means for mounting a filmstrip to intersect said light path, said means for mounting including:

(1) film channel means having first and second parallel walls and having a film strip receiving first passage therebetween, said first passage being open at both ends through which said filmstrip may slidably pass, said first and second walls having openings therein aligned with each other to permit visual access to said filmstrip within said first passage; and

(ii) channel guide means, mounted to said case and having a second passage dimensioned to slidably receive said film channel means, for removably mounting said film channel means in said case to allow said light to pass through said filmstrip when said filmstrip is located in said first passage of said film channel means and said film channel means is located in said second passage of said channel guide means, and wherein said channel guide means includes a case receiving opening and said case is positioned within said opening with said second passage of said channel guide means lying in said plane of slot.

4,390,258

PHOTOMERIC CIRCUIT FOR CAMERA

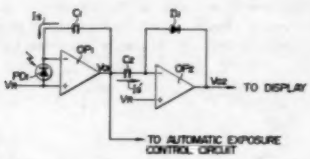
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,728

Claims priority, application Japan, Dec. 15, 1980, 55-176762; Dec. 18, 1980, 55-180064

Int. Cl.³ G03B *7/083, 17/18;* G01J *1/46*

U.S. Cl. 354—24 **16 Claims**



1. A photometric circuit for a camera including a photoelectric transducer element which is used for photometry by producing a photocurrent, and an integrating circuit including an integrating capacitor which directly integrates the photocurrent to provide an integrated output of photocurrent, characterized by a differentiator arranged in cascade connection with the integrating circuit to produce a photocurrent, output by differentiating the integrated output.

4,390,259

FLASH OUTPUT CONTROL APPARATUS FOR CAMERA

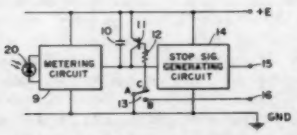
Mikio Takemae, Yokohama, and Yuji Ohkubo, Ohmiya, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,584

Claims priority, application Japan, Sep. 18, 1980, 55/128606

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—34 **5 Claims**



1. In a camera capable of flash light photographing employing a flash device comprising a flash tube which is made flashing in synchronism with a full opening of the exposure aperture by a shutter device and the quantity of flash light emitted from which is controlled by a flash output control circuit, improvements in the apparatus for controlling the operation of said flash device comprising:

(a) switch means including a first and a second electrical contact and a movable contact segment, said movable contact segment being able to move between said first and second electrical contacts in link with the full opening of the aperture by said shutter device in such manner that said segment moves away from said first contact and then comes into contact with said second contact; and

(b) control means for bringing said flash output control circuit into operation at the time when said movable contact segment leaves said first electrical contact toward said second one and for making said flash tube start flashing at the time when said segment comes into contact with said second electrical contact.

4,390,260

PLAY CONTROL FOR A THREADED DRIVE

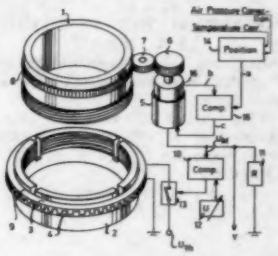
Reinhard Prinz, Aalen, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,046

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030549

Int. Cl.³ G03B *3/00;* G02B *7/04;* H02P *7/04*

U.S. Cl. 354—65 **13 Claims**



5. A precisely adjustable threaded mechanism, comprising inner and outer threaded members which are normally in circumferentially continuous radially stressed play-free engagement to the extent of requiring a characteristic maximum torque for their rotary adjustment, one with respect to the other of said members being circumferentially continuously excitable to so change its circumferential extent with respect to the circumferential-extent of the other of said members that their characteristic engagement torque is reduced from said maximum, and means for thus exciting said one member to reduce said engagement torque and for imparting thread-advancing rotary drive torque to one with respect to the other of said members, said rotary-drive torque exceeding the reduced level of engagement torque in a period of such excitation.

4,390,261

FLASH CAMERA WITH PHOTOGRAPHIC MODE SELECTOR

Hiroshi Yamamoto, and Masanori Uchidoi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,597

Claims priority, application Japan, Sep. 10, 1980, 55-125491

Int. Cl.³ G03B *1/12*

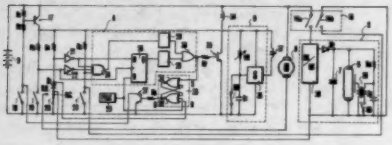
U.S. Cl. 354—173 **7 Claims**

1. A camera operable with an automatic film winder and a rechargeable electronic flash means settable into an operable condition, comprising:

a shutter button;

photographic mode change over means for changing from a continuous photographic mode in which successive pho-

tography is maintained as long as the shutter button is depressed to a single photographic mode in which ordinary single photography is achieved every time the shutter button is depressed, and for changing over to said single photographic mode in response to the flash means being set in the operable condition,



said change over means comprising first means manually operable for changing over to said both modes respectively and second means arranged in parallel with the first means, said second means being arranged for changing to said single photographic mode irrespective of the changing over of the first means for setting said camera to the single photographic mode when said rechargeable electronic flash means are set in the operable condition.

4,390,262

ELECTROMAGNETICALLY OPERATED DIAPHRAGM SHUTTER

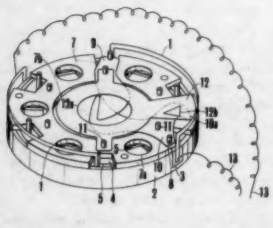
Michio Hirohata, Inagi; Yukio Ogawa, and Tetsuya Taguchi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 86,523, Oct. 19, 1979, abandoned. This application Sep. 23, 1981, Ser. No. 304,936

Claims priority, application Japan, Oct. 23, 1978, 53-130829; Dec. 1, 1978, 53-148677

Int. Cl.³ G03B *9/08*

U.S. Cl. 354—230 **56 Claims**



1. An electromagnetically operated diaphragm shutter including:

(a) a plurality of shutter blades;

(b) a sector ring drivingly connected to said shutter blades and operative upon rotation thereof to actuate said shutter blades to block and unblock a photo-taking light path;

(c) permanent magnet members oriented relative to said sector ring to form a magnetic field having a direction parallel to the optical axis of an objective lens;

(d) electrically conductive members fixedly mounted on said sector ring and arranged upon supply of a current thereto to effect movement of said ring;

(e) aperture means provided through the wall of said sector ring to form a light metering optical path, said aperture means being located out of axial alignment with said conductive members on said sector ring; and

(f) diaphragm means positioned in the light metering optical path, with at least one of said shutter blades serving as said diaphragm means, and with the size of an opening defined by said diaphragm means being correlated to the size of an aperture opening defined at any time by said shutter blades.

4,390,263

MOUNT MEMBER FOR OPTICAL APPARATUS

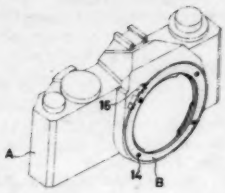
Toru Sumita, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 4, 1981, Ser. No. 260,134

Claims priority, application Japan, May 10, 1980, 55-62047

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—286 **10 Claims**



1. In a mount by which two desired components of an optical apparatus are attached to or detached from each other by being moved relative to each other in sliding contact, a mount member characterized in that the mount member has a mount surface formed on the component and is made of an oil-impregnated sintered stainless steel at least at the mount surface.

4,390,264

ELECTROSTATIC COPYING APPARATUS

Naoaki Murata, Takarazuka; Masahiro Yoshioka, Matsubara; Kiyoshi Hayashi, Takatsuki, and Yasusuke Tohi, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 99,720, Dec. 3, 1979, Pat. No. 4,325,626. This application Aug. 25, 1981, Ser. No. 296,056

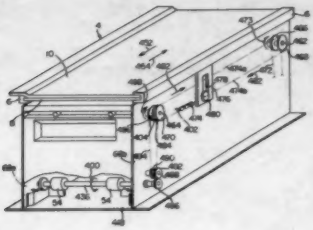
Claims priority, application Japan, Dec. 13, 1978, 53-153203; Feb. 2, 1979, 54-10304; Mar. 29, 1979, 54-41643; Apr. 5, 1979, 54-40302; May 25, 1979, 54-70992; May 25, 1979, 54-70993; May 25, 1979, 54-70994; May 25, 1979, 54-70995

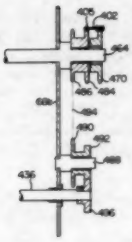
Int. Cl.³ G03G *15/00, 15/04*

U.S. Cl. 355—8 **3 Claims**

1. An electrostatic copying apparatus of the type in which an original to be copied is scanned and exposed to light, comprising an original-support means having a transparent plate for placing the original thereon, an optical system movable relative to the original-support means, and paper feed rollers rotated in regard to the movement of one of said original-support means and said optical system thereby supplying a copying paper, and a drive mechanism for reciprocating one of said original-support means and said optical system having a driven wheel and an idle wheel rotatably disposed in a spaced-apart relation to each other and a winding power transmission system wound about these wheels and drivingly connected to one of said original-support means and said optical system, a synchronizing wheel rotatably disposed adjacent to, and coaxially with, one of said driven wheel and said idle wheel of said drive mechanism, an engaging protrusion fixed to said winding power transmission system, a plurality of engaging portions capable of cooperating with said engaging protrusion formed on the peripheral edge portion of said synchronizing wheel, and said paper feed rollers being fixed to a support shaft mounted rotatably and drivingly connected to said synchronizing wheel, whereby when said drive mechanism is operated to

move said winding power transmission system, said engaging protrusion engages with one of said plurality of engaging





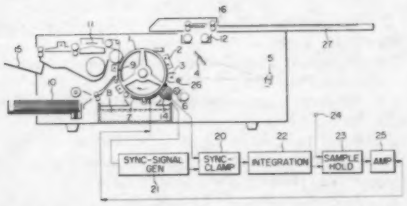
portions to rotate said synchronizing wheel and thus rotating the paper feed rollers.

4,390,265

IMAGE FORMING APPARATUS

Koji Suzuki, Yokohama; Tsuneki Inuzuka, Machida, and Kenji Kurita, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 969,885, Dec. 15, 1978, abandoned. This application Oct. 8, 1980, Ser. No. 194,985
Claims priority, application Japan, Dec. 21, 1977, 53-7839
Int. Cl.³ G03G *15/06, 15/10*
U.S. Cl. 355—14 D **12 Claims**



1. An image forming apparatus comprising:

a photosensitive member on which an electrostatic image may be repeatedly formed;

image forming process means including charging means for electrostatically charging the surface of said photosensitive member, exposure means for exposing said photosensitive member to a light image for forming an electrostatic latent image corresponding to said light image, and developing means for developing said latent image with a developer;

means for setting a light quantity level of said exposure means which is variable inclusively within a range extending between a lower limit and an upper limit;

means for detecting a state of the surface of said photosensitive member during a non-imaging period before start of the latent image formation, wherein said photosensitive member is exposed to the light of a predetermined quantity corresponding to a quantity which is not less than the lower limit but less than the upper limit during the non-imaging period, and is exposed to the light of the quantity set by said setting means during imaging; and

control means for controlling at least one of said image forming process means in accordance with an output of said detecting means.

4,390,266

EXPOSURE APPARATUS FOR ELECTRONIC DUPLICATOR

Kohachi Uchida, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 6, 1981, Ser. No. 232,219
Claims priority, application Japan, Feb. 7, 1980, 55-13855
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—14 E **4 Claims**

1. An image density detecting element for use in an image forming apparatus of the type in which an image exposure is achieved by illuminating a document and guiding light reflected therefrom to a photosensitive medium to form an image of the document thereon, comprising:

optical fiber light receiving means having a light-receiving surface of a size corresponding to an illuminated area of the document for receiving light reflected therefrom, said light receiving means comprising a plurality of optical fibers each having first and second ends, all of said first ends being aligned in a row along said light receiving surface, said second ends being gathered into a bundle that is substantially perpendicular to said light receiving surface; and

light detecting means, optically coupled to said bundled second ends of said optical fibers for receiving light from each of said second ends and generating a single electrical signal related to the total light received from all of said second ends.

4,390,267

BI-MODAL ILLUMINATION APPARATUS

James C. Minor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

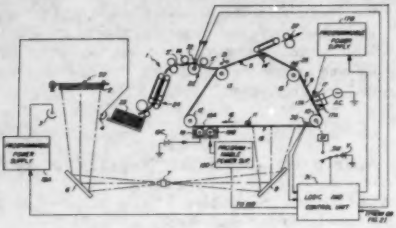
Filed Feb. 22, 1982, Ser. No. 350,651
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 E **2 Claims**

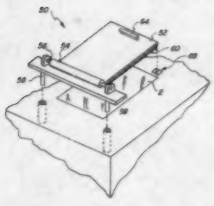
1. In apparatus having a photosensitive element, an exposure platen for receiving a document to be illuminated, an opaque cover movable between a closed position for covering a document at said exposure platen and an open position to accommodate at the platen a three-dimensional object such as a magazine or book which includes such a document and lamp means effective when energized for producing light which is reflected off a document at said exposure platen to expose said photosensitive element, the improvement comprising:

(a) switch means responsive to said cover when in said closed position for producing a first signal and responsive

to said cover when in said second position for producing a second signal; and

(b) illumination control means responsive to said first signal for energizing said lamp means to illuminate a document





at said exposure platen with light of relatively high-peak intensity and short duration and responsive to said second signal for energizing said lamp means to illuminate a document at said exposure platen with light of longer duration and lower peak intensity than said first illumination.

4,390,268

CLEANING DEVICE FOR TRANSFERRING SYSTEM WET TYPE COPYING MACHINE

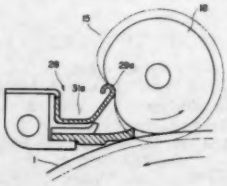
Masayoshi Furuichi; Takeshi Honjo, and Nobuo Akiba, all of Mitaka, Japan, assignors to Copyer Co., Ltd. and Canon Inc., both of Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 182,940

Claims priority, application Japan, Sep. 14, 1979, 54-118416; Sep. 19, 1979, 54-121267; Sep. 19, 1979, 54-121268

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **27 Claims**



1. In an image-forming apparatus in which an image is formed on a surface of an image-carrying member by a developing solution and is transferred onto a transferring member, a cleaning device for cleaning the surface of the image-carrying member, comprising:

a cleaning roller for cleaning the surface of the image-carrying member, said cleaning roller being disposed in contact with the surface of the image-carrying member;

a blade member for collecting the developing solution on the surface of the image-carrying member, said blade member being disposed in slidable contact with the surface of the image-carrying member and where one end portion of the blade member is in sliding contact with the outer wall of the cleaning roller;

squeezing means for squeezing the developing solution from said cleaning roller; and

discharging means for discharging the developing solution squeezed out by the squeezing means.

4,390,269

COPYING MACHINE

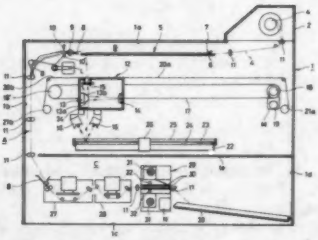
Kojiro Henmi, and Kiyosi Takenaka, both of Hikone, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 2, 1981, Ser. No. 279,949

Claims priority, application Japan, Jul. 10, 1980, 55-97460[U]

Int. Cl.³ G03B *27/32, 27/52*

U.S. Cl. 355—27 **7 Claims**



1. A copying machine comprising:

transfer means for transferring a sensitive material first along a ceiling surface of a box-shaped body of said copying machine in a substantially horizontal direction, then along a side wall in a substantially vertical direction, and finally along a bottom surface in a substantially horizontal direction,

a photographing zone arranged within an upper space in said machine body,

a development zone arranged within a bottom space in said machine body, and

a magazine mounted on the ceiling of the machine body for therein housing a rolled-up sensitive material,

wherein said photographing zone includes an exposure zone positioned substantially horizontally so as to oppose said sensitive material transferred along said ceiling surface of the machine body, an original picture stand positioned immediately below and parallel to said exposure zone, and a slit exposure scanner arranged between said exposure zone and said original picture stand so as to make reciprocatory movements in a lateral direction therebetween for forming images on the photosensitive surface of said sensitive material, said images transferred into said exposure zone from an original picture set on said original picture stand, and

said development zone comprises a development tank and a stabilizer tank arranged successively and horizontally through which said exposed material passes to be developed.

4,390,270

PHOTOGRAPHIC COPIER

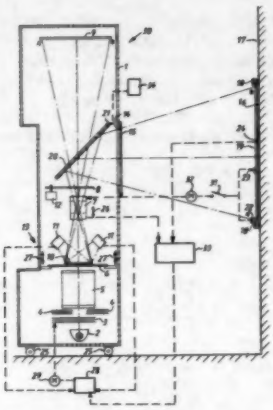
Ernst Biedermann, Taufkirchen; Günter Findeis, Sauerlach; Klaus Weber, Leverkusen, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 28, 1981, Ser. No. 287,571

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028676

Int. Cl.³ G03B 27/44

U.S. Cl. 355—46 13 Claims



1. A copying installation, particularly a photographic copying installation comprising:

(a) supporting means for an original to be copied;

(b) projecting means for projecting an image of the original to a first location at which the image has a first size, said projecting means comprising a lens;

(c) reflecting means for reflecting the image of the original to a second location at which the image has a second size, said reflecting means being arranged between said lens and said first location and being mounted for pivotable movement between an operative position in which it reflects the image of the original and an inoperative position; and

(d) a housing for said supporting means, projecting means and reflecting means, wherein said first location is inside said housing and said second location is outside said housing, said housing having an opening to permit travel of the image to said second location.

4,390,271

PROCESS FOR PRODUCING ORTHOGRAPHIC PROJECTION IMAGE OF COMPLEX TERRAIN/TARGETS FROM AN AUTOMATIC SYSTEM USING TWO PHOTOGRAPHS

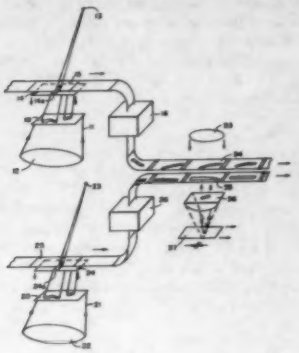
James L. Smith, Grand Prairie, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1981, Ser. No. 330,117

Int. Cl.³ G03B 27/32

U.S. Cl. 355—77 4 Claims

1. A system for producing an edge-enhanced, darkfield, orthographic projection image of complexed terrain/target configuration comprising making two different photographs of the complex terrain/target, utilizing the photographs to produce edge-enhanced, darkfield transparencies, utilizing said transparencies to expose recording frames, developing said recording frames to produce positive transparencies, superimposing said positive transparencies one over the other, passing collimated light from a light source through transparent portions of the positive transparencies to a focusing lens that focuses the light transmitted through said positive transparencies to one line on a recording plate which, when containing an



ensemble of such lines, produces an edge-enhanced, orthographic projection of the terrain/target configuration on the recording plate.

4,390,272

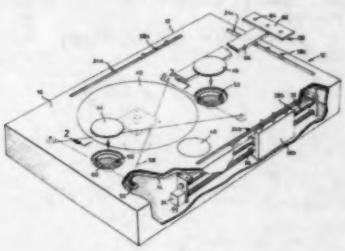
PHOTOGRAPHIC DISTORTION METHOD AND APPARATUS

James Anderson, 12 East Rd., Scarborough, Ontario, Canada (M1N 2A1)

Filed Jul. 29, 1981, Ser. No. 288,049

Int. Cl.³ G03B 27/10

U.S. Cl. 355—84 10 Claims



1. A method of obtaining a distorted photographic reproduction from a negative photographic image, comprising the steps of:

attaching a sheet of photosensitive printing paper to a planar surface;

locating the negative photographic image over the sheet of printing paper;

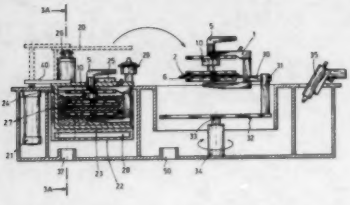
positioning a mask with an exposure slit transversely over the negative photographic image; and

moving the negative laterally with respect to the paper and simultaneously moving the mask and slit laterally with respect to the negative image while exposing the mask and slit to a light source.

4,390,273
PROJECTION MASK AS WELL AS A METHOD AND APPARATUS FOR THE EMBEDDING THEREOF AND PROJECTION PRINTING SYSTEM

Ernst W. Loebach, Eschen, and Harry L. Sawatzki, Vaduz, both of Liechtenstein, assignors to Censor Patent-und Versuchsanstalt, Vaduz, Liechtenstein

Filed Feb. 17, 1981, Ser. No. 235,319
Int. Cl.³ G03B 27/28
U.S. Cl. 355—125 17 Claims

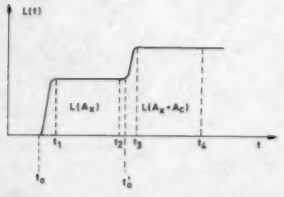


1. A projection mask, comprising
a substrate glass carrying a mask pattern thereon,
a cover glass covering said mask pattern and defining a space between said cover glass and said substrate glass carrying said mask pattern, said cover glass being sealed to said substrate glass exclusively at peripheral edges of at least one of said glasses,
a substantially particle-free transparent non-solid fluid in said space such that lateral forces are not transmittable thereby.

4,390,274
USE OF A METHOD, PARTICULARLY AN AUTOMATIC METHOD, FOR MEASURING LIGHT AS WELL AS IMPROVEMENTS AND APPARATUSES FOR CARRYING OUT THE SAME

Fritz Berthold, Engelsbranderstrasse 12, 754 Neuenbürg, Fed. Rep. of Germany; Seppo Kolehmainen, Ganzenstraat 11, Zolder, Belgium, and Veikko Tarkkanen, Breulsweg 1, Wijlre, Netherlands

Filed Jan. 10, 1980, Ser. No. 111,000
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901919
Int. Cl.³ G01N 1/00, 21/00; C12Q 1/66
U.S. Cl. 356—36 38 Claims

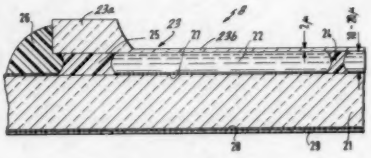


1. In a method for photometrically measuring a reaction process in which a sample has been transferred to a darkened measuring station, the sample containing an unknown quantity of a substance which acts as a reaction partner with a reagent, a first photometric measurement is taken at the darkened measuring station during the course of a reaction between a first reagent and a reaction partner which is present in the sample, and said first measurement is used for computation, the improvement comprising:
adding to the sample prior to its transfer to said darkened measuring station said first reagent;
after said first photometric measurement, adding to the sample at said darkening measuring station at least one additional reagent which is different from the first reagent, and which constitutes an additional reaction partner;
conducting a photometric measurement of the sample after the addition of each said additional reagent and during the course of a reaction between reaction partners then present in the sample; and
determining from the values determined during all of the measurements, the unknown quantity of the substance present in the sample.

4,390,275
MEASURING MINUTE, LOCAL TEMPERATURE DIFFERENCES

Lothar Schilf, Achim, and Ingo H. Giese, Bremen, both of Fed. Rep. of Germany, assignors to Erno-Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,182
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950047
Int. Cl.³ G01J 5/00; G02F 1/13
U.S. Cl. 356—43 16 Claims

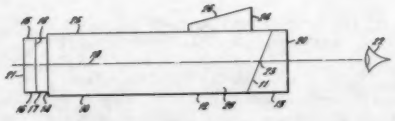


1. An object carrier for use in equipment measuring local temperature differences, comprising:
a first carrier plate;
a liquid crystal layer on the first carrier; and
a second plate on the crystal layer having a thickness of a few micrometers, being considerably less than the thickness of the liquid crystal layer.

4,390,276
COLLIMATOR GUNSIGHT

Raymond G. Budden, Havant, and Fraser Scott, Guildford, both of England, assignors to Ring Sights Limited, Surrey, England

Filed May 13, 1981, Ser. No. 263,068
Claims priority, application United Kingdom, May 14, 1980, 8015977
Int. Cl.³ G02B 23/10
U.S. Cl. 356—251 6 Claims



3. A collimator gun sight which comprises a block of solid, transparent material which has a substantially uniform reflective index, the block providing a line of sight therethrough by which a target can be viewed in substantially undeviated form, the block including
a body through which the line of sight passes, the body including a first planar end surface which forms the proximal end of the gun sight, an opposite, second planar end surface which forms the distal end of the gun sight, and a side surface, the first and second end surfaces being parallel to one another,
means within the body near the second planar end surface

thereof defining a partially reflecting transparent concave surface being symmetrical about its optical axis which is aligned in parallel with the line of sight,

one or more flat reflecting surfaces located within the body in one or more parallel planes which are oriented at an acute angle to the optical axis of the partially reflecting transparent concave surface and provide a graticule pattern, a virtual image of which can be provided in the partially reflecting transparent concave surface by reflected light, the graticule pattern forming an aiming mark superimposed on the target being viewed along the line of sight, the graticule pattern defined by the reflecting surfaces to be sufficiently fine that the virtual image thereof and the target can be seen therethrough, and

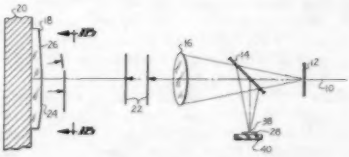
prism means cemented to the side of the body at a point between the reflecting surface(s) and the partially reflecting transparent concave surface in the body, the prism means deflecting ambient light from a predetermined sector external of the gun sight into the body and towards the reflecting surface(s) so as to be reflected thereby and into the partially reflecting transparent concave surface and provide a virtual image of the graticule pattern thereon.

4,390,277

FLAT SHEET SCATTEROMETER

Bernard W. Quinn, Rancho Palos Verdes, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 31, 1980, Ser. No. 174,194
Int. Cl.³ G01B *11/30*
U.S. Cl. 356—371 **25 Claims**



1. A flat sheet scatterometer for determining surface variations of a planar surface comprising:

a monochromatic light source;

light controlling and directing means adapted to control and direct light produced by said source;

light collimating means adapted to receive light from said controlling means;

light directing means adapted to receive light from said collimating means, direct said light to an object, receive light reflected by said object and reflect it back to said collimating means;

a beam splitter adapted to receive said reflected light from said collimating means and separate said light from non-reflected light, said beam splitter being rotatable about two axes;

coplanar light sensing means positioned at the focal plane of the reflected light exiting said collimating means and adapted to produce electrical signals responsive to the amount of light in said reflected beam and the amount of light scattered by the reflective surface; and

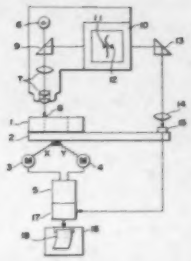
means for indicating the RMS scattering of said reflected light.

4,390,278

METHOD OF AND APPARATUS FOR INSPECTING THE ACCURACY OF A MACHINED CONTOUR IN A WORKPIECE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Oct. 8, 1980, Ser. No. 194,947
Claims priority, application Japan, Oct. 9, 1979, 54-130302
Int. Cl.³ G01B *9/08, 11/00*
U.S. Cl. 356—392 **7 Claims**



1. A method of inspecting the accuracy of a machined contour in a workpiece with respect to a desired contour, comprising the steps of:

focusing a light beam from a light source on a focal area on said workpiece;

guiding a reflection from said focal area to project an optical image therefrom on a display screen having predetermined indicia;

positioning said workpiece to locate a portion of said machined contour in said focal area in a predetermined coordinate system;

displacing said workpiece in said predetermined coordinate system so that said focal area effectively moves on said workpiece along a path of said desired contour, thereby scanning said machined contour; and

monitoring on said display screen said projected image representing said machined contour with reference to said indicia to determine a deviation of said machined contour from said desired contour one portion after another.

4,390,279

ALIGNMENT DEVICE IN AN IC PROJECTION EXPOSURE APPARATUS

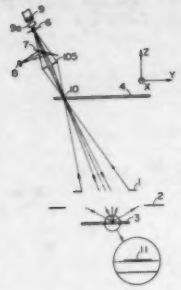
Kyoichi Suwa, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,794
Claims priority, application Japan, Jul. 12, 1979, 54-87460; Jul. 12, 1979, 54-87461; Jul. 12, 1979, 54-87462
Int. Cl.³ G01B *11/00*
U.S. Cl. 356—401 **6 Claims**

1. In an alignment device including a projection lens system for forming an image of a light source on a wafer surface through a mask, the wafer surface having a first reference mark thereon comprising a periodic pattern structure having a predetermined period in a first direction and the mask having a second reference mark on a surface thereof which is to be aligned with the first reference mark, the wafer surface regularly reflecting the light from locations thereon at which the first reference mark is not present and reflecting zero primary and higher order components of diffracted light from a location at which the first reference mark is present, and including an observation optical system having means for detecting light reflected from the wafer surface and passed through the projection lens system, the improvement comprising:

means for selecting a predetermined one of the diffracted light components reflected from the wafer surface and for directing said predetermined component to the observa-

tion optical system, said means including a light-intercepting member positioned near a pupil of the observation optical system and formed with a light-transmitting opening extending in a second direction orthogonal to the first direction, the light-transmitting opening being formed to



pass substantially all of the light reflected from locations on the wafer surface at which the first reference mark is not present, and being formed to pass only the zero order component of diffracted light reflected from the location on the wafer surface at which the first reference mark is present.

4,390,280

ILLUMINATION CONTROL FOR A DENSITOMETER AND DENSITY MEASURING DEVICE HAVING SUCH CONTROL

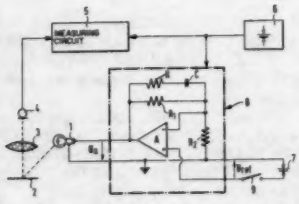
Tino Celio, Ambri, and Hans Ott, Regensdorf, both of Switzerland, assignors to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Sep. 25, 1980, Ser. No. 190,572

Claims priority, application Switzerland, Sep. 28, 1979, 8792/79

Int. Cl.³ G01N *21/01*; H05B *37/02, 39/02*

U.S. Cl. 356—445 **7 Claims**



1. An illumination control system for measuring instruments of the type that measure a property of an object under test with the aid of light derived via the object from an incandescent electric lamp as a source of measuring light, comprising:

a control stage for supplying energizing voltage to the lamp;

means for supplying the control stage with a reference voltage to set the energizing voltage at a given, constant, final value; switch means connected to the control stage for switching on and off the supply of energizing voltage thereby;

wherein said control stage includes means which sets the relationship of the energizing voltage to the reference voltage such that, upon said switch being turned to the "on" position, the energizing voltage assumes a value 1-2% less than said given, constant, final value and then rises to said given, constant, final value over a period of about 1 to 3 seconds.

4,390,281

SLURRY GUN

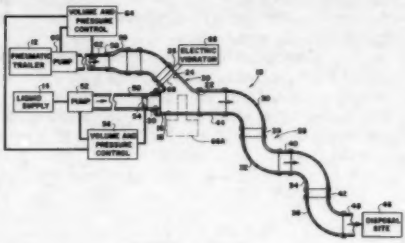
William F. Scriminger, Muskogee, Okla., assignor to Muskogee Environmental Conservation Co., Muskogee, Okla.

Continuation-in-part of Ser. No. 32,165, Apr. 23, 1979, Pat. No. 4,295,744. This application Aug. 18, 1980, Ser. No. 179,015

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.³ B28C *5/06*

U.S. Cl. 366—3 **11 Claims**



1. A slurry gun for the mixing of aerated fly ash and a wetting agent comprising

(a) an elongated horizontal housing disposed in a vertical plane, open at both ends to create a material introduction chamber;

(b) a horizontal wetting agent inlet port in the vertical plane of said housing communicating with a first open end of said housing for the horizontal longitudinal introduction of a wetting agent into the housing under pressure;

(c) an aerated fly ash inlet port disposed in the vertical plane of said housing and connected to the top of the housing in communication with the interior of the housing intermediate the ends thereof, said fly ash inlet port being disposed at an acute angle with respect to the wetting agent inlet port for the introduction of aerated fly ash therein under pressure; and

(d) a mixing apparatus operably secured to the second end of said horizontally disposed housing and comprising a contorted passageway having a plurality of closely connected right angle bends providing portions extending in vertical planes within and parallel said vertical plane of said housing and portions extending perpendicularly to said vertical plane of said housing in at least one horizontal plane for creating a turbulent descending path for the material; and

(e) a slurry outlet port disposed at a lower elevation than that of the housing and of the contorted passageway.

8. A method for mixing a slurry of fly ash and a wetting agent comprising the steps of

(a) introducing the wetting agent horizontally into a material introduction chamber disposed in a vertical plane under pressure and at a controlled volume;

(b) introducing aerated fly ash into the introduction chamber downwardly in said chamber vertical plane and outwardly at an acute angle with respect to the flow of wetting agent at a controlled volume of fly ash and pressure of air and

(c) creating turbulence downstream of the introduction chamber by passing the fly ash and wetting agent through a contorted path defined by a series of right angle paths some of which are in the vertical plane of the material introduction chamber and in planes parallel such plane and some of which right angle paths are in at least one horizontal plane perpendicular the vertical plane of the material introduction chamber for thoroughly mixing the fly ash and the wetting agent into a slurry.

4,390,282

CONTAINER

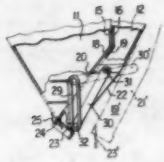
Willem J. H. Bake, c/o R. A. Marriner, Aries Corp., 1225 Hodges Rd., Lake Charles, La. 70601

Continuation-in-part of Ser. No. 2,089, Jan. 9, 1979, abandoned, which is a division of Ser. No. 3,612, Jan. 15, 1979, Pat. No. 4,189,237, which is a continuation of Ser. No. 758,795, Jan. 12, 1977, abandoned. This application Aug. 21, 1980, Ser. No. 180,104

Claims priority, application Netherlands, Jul. 6, 1976, 7607466

Int. Cl.³ B01F *15/02*; B28C *7/04*

U.S. Cl. 366—40 7 Claims



1. A self-discharging container comprising, in combination:

a plurality of container portions movably associated with each other for relative movement between a contents-containing closed position and a contents-discharging open position; and

auxiliary support means operatively associated with said container portions for automatically effecting said relative movement to said contents-discharging position in response to at least partial support of said container weight by said auxiliary support means.

4,390,283

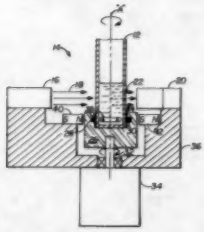
MAGNETIC STIRRER FOR SAMPLE CONTAINER

Richard C. Meyer, La Habra, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 71,812, Sep. 4, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,428

Int. Cl.³ B01F *13/08*, *15/00*

U.S. Cl. 366—142 5 Claims



1. In apparatus of the type having a sample container for holding sample material to be assayed and a stirring element within the container for stirring material therein, said stirring element separate from said container to allow relative movement of said container with respect to said stirring element, the improvement comprising:

means for rotatably supporting the sample container;

means for rotating the sample container to cause corresponding rotational movement of material therein; and

magnetic means external to the container and magnetically coupled to the separate stirring element therein in a manner retaining the separate stirring element in a fixed relative position during rotation of the sample container whereby stirring of the sample material is achieved during said rotation by the rotational motion of the sample material around and past the fixed stirring element.

4,390,284

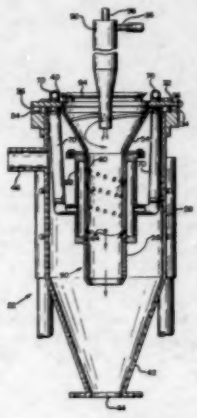
METHOD AND APPARATUS FOR WETTING POWDER

Paul E. Hyde, Corvallis, and John A. Rowell, Albany, both of Oreg., assignors to Neptune Microfloc, Inc., Corvallis, Oreg.

Filed Jan. 25, 1980, Ser. No. 115,295

Int. Cl.³ B01F *5/20*

U.S. Cl. 366—165 16 Claims



8. An apparatus for wetting a particulate material to form a homogeneous solution and/or mixture comprising:

a generally vertical wetter column;

a plurality of nozzles located on the interior of said column and arranged generally in a single helix array, each nozzle being adapted to produce an inwardly directed, fan-shaped wetting jet;

means for providing pressurized liquid to said nozzles; and

feed means for feeding particulate material to be wetted into the top of said column.

4,390,285

METHOD AND APPARATUS FOR MIXING SOLIDS WITH LIQUIDS, IN PARTICULAR FOR GLUING WOOD CHIPS

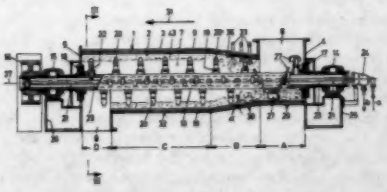
Herbert Dürr, Viernheim; Werner Christen, and Helmut Müller, both of Mannheim, all of Fed. Rep. of Germany, assignors to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 12, 1981, Ser. No. 292,213

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1980, 3032039; Sep. 26, 1980, 3036346; Feb. 16, 1981, 3105549

Int. Cl.³ B01F *5/04*, *7/04*

U.S. Cl. 366—168 14 Claims



1. A method for mixing of particulate solids with liquids, in particular for gluing wood chips or the like, wherein there is an

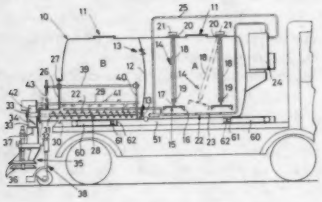
intensive movement of the solids during the addition of the liquid and a subsequent thorough mixing of the liquid and the solids in a ring of material to be mixed, characterized in that the solids are steadily accelerated out of an axial motion via a centrifugal and helical motion and the addition of liquid is effected during this acceleration, and that the acceleration to the velocity of the ring of material to be mixed takes place only following the addition of the liquid.

4,390,286

PLANT COMPOSED OF MULTI-FUNCTIONAL APPARATUS FOR DELIVERING SUBSTANCES FOR TREATING ROADWAYS OR THE LAND, AND WHICH CAN BE SELF-LOADED FROM THE GROUND ON TO THE PLATFORM OF A TRANSPORTER VEHICLE, AND VICE VERSA

Pietro Regaldo, C.so Agnelli, 81, Torino, Italy

Filed Mar. 4, 1982, Ser. No. 354,881
Claims priority, application Italy, Jul. 29, 1981, 68054 A/81
Int. Cl.³ B01F *15/02, 7/26*
U.S. Cl. 366—186 **5 Claims**



1. A plant composed of multi-functional apparatus for delivering substances for the treatment of roadways or the land, characterised by comprising a tank divided by a wall into two separate chambers each accessible through a manhole, and which can be connected together by opening valves provided in the wall, one of said chambers comprising agitator means for a liquid and a solute contained in said chamber so as to form a complete solution of the solute in the liquid, motor means being provided for withdrawing and delivering the solution, the second chamber comprising second agitator means for solid material contained in the chamber, and means for withdrawing it and feeding it to distributor means therefor, said second agitator and withdrawal means being extractable from the chamber through an aperture which can be closed by means of a suitable cover; the tank being supported by a rigid quadrilateral frame provided with legs which can extend under hydraulic control and are each provided with orthogonal shafts which are inserted into the cross members of the frame in order to define, by the use of locking means, respective horizontal and vertical positions of the legs in which they lie against or are distant from the frame, each shaft having a length greater than one half the length of the cross member into which it is inserted, and a diameter different from the shaft opposite which is also inserted into the cross member, so that one shaft can be inserted into the other when the legs lie against the frame.

4,390,287

ELECTRONIC DEVICE HAVING TIME DISPLAY FUNCTION

Morio Morishige, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 210,036
Claims priority, application Japan, Dec. 5, 1979, 54-157911
Int. Cl.³ G04C *19/00*
U.S. Cl. 368—240 **7 Claims**

1. An electronic device having a timing display function comprising:

present time counting means for counting reference signals to obtain present time data comprised of at least hour unit data and minute unit data;

analog display means including at least 60 optical indicators for causing the present time data obtained at the present time counting means to be displayed by the display position of selected indicators of said at least 60 optical indicators;

time data storing means for storing a plurality of time data different from the present time data obtained at the present time counting means, said time data stored in said time data storing means comprising at least hour unit data and minute unit data;

readout means coupled to said time data storing means for selectively causing only a plurality of different time data which are of the order of hour unit data the same as hour unit data obtained at the present time counting means to be read out of said time data storing means; and

display control means coupled to said display means and to said readout means for causing at least the minute unit data of said plurality of different time data read out by said readout means to be simultaneously displayed by the display position of selected indicators of said at least 60 optical indicators.

4,390,288

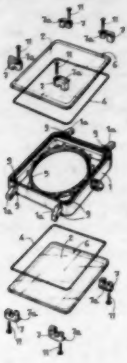
WATCH CASING

Jean Arnoux, Le Noirmont, Switzerland, assignor to Cesar Arnoux, S.A., Le-Noirmont, Switzerland

Filed Mar. 23, 1982, Ser. No. 361,529
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—276 **10 Claims**

1. Watch casing having a casing body and comprising upper and lower elements of the casing secured to the casing body by four pairs of clamps engaging each on one of four outer protrusions of the said casing body, the tightening being ensured by screws traversing each one of the clamps in each of the respec-

tive pairs to enable the two clamps of each pair to move towards each other by slipping on the protrusion of the casing



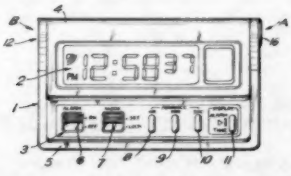
body on which they are engaged, thus securing to the casing body the respective upper and lower elements.

4,390,289

TIMEPIECE WITH MULTIFUNCTIONAL MEMBER

John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Aug. 14, 1981, Ser. No. 292,756
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—286 **8 Claims**



1. In a timepiece construction having time display means disposed inside a housing, the combination of:

a housing member having a window portion through which the time display means can be viewed and an actuator-receiving portion adjacent said window portion,

first actuator means mounted in the actuator-receiving portion of the housing and connected to control selected functions of the timepiece, and

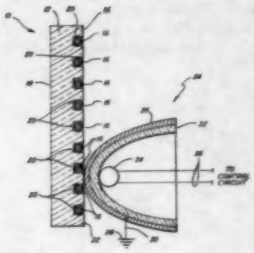
a multifunctional member defining an open portion and a cover portion adjacent thereto, said member being pivotally mounted on the housing and pivotable to a first position in front of the housing such that the cover portion overlies the first actuator means to prevent accidental actuation during carrying and the open portion accomodates the window portion to permit viewing of the time display means while the first actuator means is covered, and pivotable to a second position behind the housing such that said member functions as stand means for supporting the timepiece.

4,390,290

TEMPERATURE SENSOR FOR A RESISTANCE FURNACE

Michael J. O'Neill, Wilton, and Harold I. Hill, Fairfield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 31, 1981, Ser. No. 249,534
Int. Cl.³ G01K *7/04, 13/00*
U.S. Cl. 374—142 **9 Claims**



1. An apparatus, in combination with a resistance furnace, comprising:

an electrically conductive member physically contacting an external wall of said furnace, said member being connected to a system ground potential via an electrically conductive ground strap;

an electrically insulating member adjacent said electrically conductive member and spaced apart from said external wall thereby; and

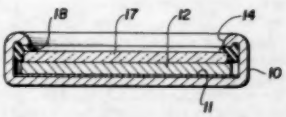
a thermocouple affixed to said electrically insulating member.

4,390,291

THERMAL INDICATOR FOR WELLS

Joseph V. Gaven, Jr., Oakton, Va., and Chan S. Bak, Newbury Park, Calif., assignors to Spectro-Systems, Incorporated, Oakton, Va.

Filed Dec. 10, 1980, Ser. No. 215,085
Int. Cl.³ G01K *1/14, 11/06, 13/02*
U.S. Cl. 374—160 **11 Claims**



1. A thermal indicator for circulation with fluid in a well and sized to pass through the fluid ports of a well drilling bit for indicating if a chosen temperature range has been encountered in the well, comprising a shallow pan-like retainer body of durable sheet material having a bottom surface portion adapted to bear a substantially permanent identifying marking and having an open top, a meltable solid metal alloy indicator component having a narrowly defined single melting temperature range chosen from the temperature spectrum 76° C. to 351° C. normally encountered in a well, said indicator component at least partially covering the bottom portion prior to melting of said component and being exposed for contact with the fluid circulated in the well, a flange-like formation on said retainer body adjacent the open top thereof, said meltable solid metal alloy indicator component extending across the bottom surface portion and beneath said flange-like formation at opposite sides of said retainer body, and said flange-like formation mechanically fixedly securing opposite sides of said component to said retainer body prior to the melting of said compo-

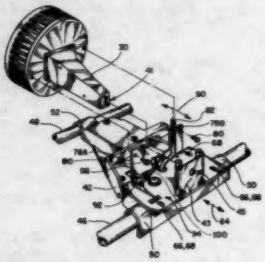
nent, whereby when the narrowly defined melting temperature range of said indicator component is encountered in the well said component melts from beneath said flange-like formation and separates from said retainer body exposing said bottom portion and is lost in the fluid in the well.

4,390,292

MEANS AND METHOD FOR COMPENSATING FOR PRINT MEDIUM THICKNESS IN LINE PRINTERS

Horst M. Kresz, St. Joseph, Mich., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 3, 1981, Ser. No. 317,810
Int. Cl.³ B41J *25/00, 29/00*
U.S. Cl. 400—59 **1 Claim**



1. For use in a line printer having a print head supported upon a carriage for traversing a path spaced from but parallel to a platen for printing dot-matrix characters through an inked ribbon onto a print medium drawn between said ribbon and said platen, print head spacing adjustment means comprising:

a bracket, having an access aperture, slidably mounted on and overlying said carriage for enabling movement of said bracket toward and away from said platen;

means extending from said bracket for mounting said print head on said bracket;

slot means disposed in said carriage;

a bracket adjusting member consisting of a lever comprising an elongated arm terminated by an offset portion pivotally seated in said carriage slot means and captivated therein by said overlying bracket and with said elongated arm extending through said bracket access aperture and communicating with the wall of said aperture to afford manual adjustment of the spacing of said print head with respect to said platen by pivotal movement of said lever;

spring-biased pointer means pivotally mounted on said carriage and having one end thereof engaging said mounting means extending from said bracket, said bracket having indicia thereon beneath the traverse of said pointer means such that bracket movement and hence print head movement is translated into pointer movement to facilitate rapid set up of said print head by providing for a gross indication by said indicia of print head location with respect to said platen;

whereby the spacing between said print head and said platen can be quickly adjusted by movement of said lever to accommodate print media of different thicknesses.

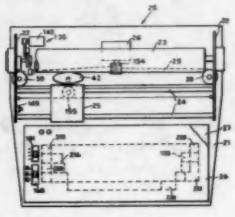
4,390,293

ELECTRONIC TYPEWRITER

Giuseppe Gubau, Ivrea; Domenico Roano, Parella, and Giovanni Quaranti, Banchette, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Dec. 12, 1980, Ser. No. 215,722
Claims priority, application Italy, Dec. 21, 1979, 69450 A/79
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—144.2 **20 Claims**

1. An electronic typewriter comprising a character-carrier disc having flexible fingers, each one carrying a character, a selection motor having the rotor connectable with the disc for the rotation thereof, a digital transducer for revealing incremental rotations of said character-carrier disc and having a plurality of switching area associated with said fingers, and sensing means revealing the presence of said switching areas on a predetermined position for generating a transducer position signal, wherein said transducer position signal is representative of a coarse location of each of said fingers in front of the point of typing, a velocity servo-control circuit for the selection motor including a first means responsive to angular distances of the desired character from the coarse location for generating a corresponding desired velocity signal, second means responsive to each transducer position signal and to a preceding transducer position signal for generating an actual velocity signal, and motor actuating means responsive to said



actual velocity signal and to said desired velocity signal for causing the rotor of said selecting motor to be rotated in accordance with a predetermined law of motion, wherein said velocity servo-control means arrests the rotor when the desired character reaches said coarse location in front of the point of typing, and means for fine positioning said desired character in front of the point of typing comprising a correction wheel mounted synchronously with said character-carrier disc and provided with a series of peripheral recess means associated with said fingers, tooth means actuatable for engaging with each of said series of recess means, and correction actuating means responsive to reached coarse location of said desired character for actuating said tooth means, and wherein the engagement of said tooth means with said recess means causes fine positioning of the desired character in front of the point of typing.

4,390,294

RIBBON RE-INKING MACHINE CAPABLE OF RELOADING A VARIETY OF TYPES OF RIBBON CASSETTES

Albert J. Castro, San Gabriel, Calif., assignor to Westates Space-Era Products, Inc. dba Wespac, South El Monte, Calif.

Filed Sep. 2, 1980, Ser. No. 183,204
Int. Cl.³ B41J *33/10*
U.S. Cl. 400—196.1 **16 Claims**

1. An improvement in a ribbon machine of the type capable of feeding a ribbon into a ribbon cassette, the cassette being of the type having a ribbon discharge opening and a ribbon feed opening, which comprises:

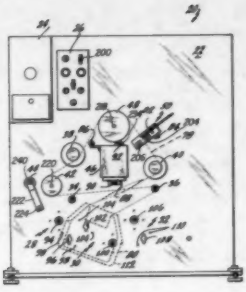
a support surface;

ribbon guide means associated with said support surface for guiding said ribbon over said support surface from the ribbon discharge opening to the ribbon feed opening of said cassette;

at least two cassette adapters, each adapter including cassette holding means capable of reversibly holding on said adapter at least one type of a variety of types of cassettes, and each of said cassette adapters (holders) capable of holding a different type of cassette;

a plurality of adapter positions located on said support surface, each of said adapter positions including cassette drive means and cassette adapter holding means, each of

said cassette adapters capable of being held by the respective cassette adapter holding means at one of said plurality of adapter positions;



each of said cassette adapters including cassette driven means transfer means capable of allowing said cassette drive means to interact with said cassette to feed said ribbon into said cassette.

4,390,295

CARRIAGE SUPPORT FOR TYPEWRITER

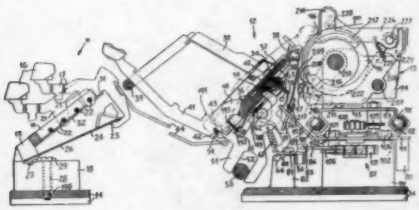
Walter Albrile, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 20, 1980, Ser. No. 132,394

Claims priority, application Italy, Mar. 22, 1979, 67589 A/79

Int. Cl.³ B41J *19/00*

U.S. Cl. 400—330.1 **8 Claims**



1. A typewriter of the type comprising a type bar basket having a plurality of type bars and a guiding fork for a striking type bar; a base structure mounting said type bar basket; a carriage module including a carriage transversely movable with respect to said fork, wherein said carriage module has a movable guide, a platen mounted on said movable guide, and a fixed guide for slidably supporting said movable guide; at least one spacing command member supported by said base structure and operable by the striking type bar for commanding the spacing of said platen; a carriage spacing mechanism including a draw spring connected to drive said movable guide, a rack mounted on said movable guide, a pinion in engagement with said rack, a spacing toothed wheel bodily connected with said pinion and a spacing tooth engaging with said spacing toothed wheel and wherein said spacing tooth is actuatable to release said toothed wheel and re-engage said toothed wheel for effecting the spacing of said platen; mounting means for mounting together said carriage module and said carriage spacing mechanism as a unit, wherein said unit operates to guide and space said platen with respect to said fixed guide independently from said base structure; and fixing means for exactly fixing said unit on said base structure; wherein said mounting means comprise a support plate mounting said draw spring, said fixed guide, said pinion and said spacing tooth; wherein said fixing means comprise a coupling slot on said support plate for coupling a pin member fixed on said type bar basket adjacently to said fork and locking screws locking said support plate on said base structure; and wherein said fixing means put said spacing tooth in front of said at least one spacing command member for causing said tooth to be actuated by said command member.

4,390,296

PRINTING MACHINE

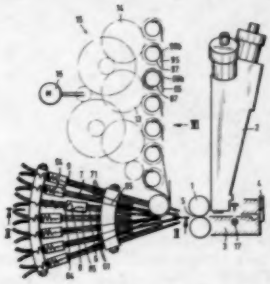
Fritz Siegenthaler, Trub, Switzerland, assignor to Autelca, AG, Switzerland

Filed Sep. 10, 1981, Ser. No. 300,912

Claims priority, application Switzerland, Sep. 19, 1980, 7030/80

Int. Cl.³ B41J *15/18, 11/50*

U.S. Cl. 400—608 **8 Claims**



1. A machine for printing respectively one section of an individually selected one of a plurality of strips of printing material (**11, 12**) and for cutting off the printed section, comprising

printing means (**2**) for printing on a respective section of one of said strips of said plurality of strips (**11, 12**);

a plurality of flat guide channels (**6, 7**), each for guiding one of said plurality of strips (**11, 12**);

a pair of feed rollers (**1**) connected between said printing means (**2**) and said plurality of flat guide channels (**6, 7**);

cutting means (**4**) connected on the opposite side of said printing means (**2**) from said pair of feed rollers (**1**) for cutting off the respective section of said one of said strips imprinted by said printing means (**2**);

said pair of feed rollers providing a nip (**5**) therebetween facing away from said printing means (**2**) and rotatable in one direction for advancing a respective one of said strips (**11, 12**) guided in the respective flat guide channel (**6, 7**) to said printing means (**2**) and then to said cutting means (**4**), and rotatable in the opposed direction for returning the said respective one of said strips to leave said nip (**5**);

said plurality of flat guide channels (**6, 7**) being arranged in a fan shape and oriented towards said nip (**5**) of said feed rollers (**1**);

a plurality of gripping means (**8, 9**) each associated with one of said flat guide channels (**6, 7**) and having a normally gripping position gripping the strip (**11, 12**) in the respective flat guide channel (**6, 7**), said gripping means (**8, 9**) being individually displaceable for advancing and returning along a path extending on a longitudinal portion of the respective flat guide channel and having a length corresponding approximately to the distance between said fan shape arrangement of said plurality of flat guide channels (**6, 7**) and said nip (**5**) of said feed rollers (**1**);

control means (**68,83**) connected between said gripping means and said flat guide channels for retaining said gripping means (**8, 9**) in a released position when at the forward end of said path of displacement; and

displacement means (**13–16, 89***b*, **87, 85, 99***b*, **97, 95**) connected to said plurality of gripping means (**8, 9**) for ad-

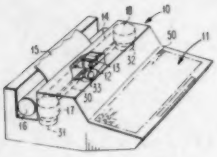
vancing a selected one of said gripping means (8, 9) along said path toward said nip (5) of said feed rollers (1) in the beginning of said rotation of said feed rollers (1) and for returning at the end of the said rotation.

4,390,297

METHOD AND APPARATUS FOR CORRECTION OF NON-IMPACT PRINTING

Janise N. Gaitos, San Jose; Meredith D. Shattuck, Hollister, and Clayton V. Wilbur, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,197
Int. Cl.³ B41J *29/16*
U.S. Cl. 400—697.1 5 Claims



1. A method for correcting non-impact printed data a character at a time comprising the steps of:

printing the characters with a printing head utilizing a non-impact printing technique which deposits a detectable thickness of thermoplastic marking material on a record medium;

providing a corrective ribbon which carries a pressure transferable opaque adherent pigmented material on one surface thereof;

interposing said corrective ribbon between said record medium and said printing head;

positioning the character to be corrected into an impressing position; and

selectively producing pressure to move the corrective ribbon into intimate contact over an area registering with the incremental area of said record medium containing the printed character to be corrected, so that the opaque adherent pigmented material is transferred only to the character to be corrected.

4,390,298

UNIVERSAL WIPER PLUG FOR LIQUID COSMETIC PRODUCTS

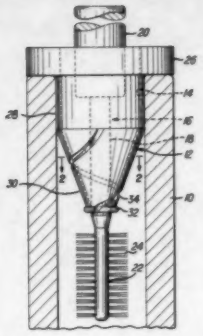
John F. Carluccio, 836 High Mountain Rd., Franklin Lakes, N.J. 07417

Filed Oct. 21, 1981, Ser. No. 313,367
Int. Cl.³ A46B *11/00*
U.S. Cl. 401—122 4 Claims

1. A wiper plug for liquid cosmetic products, for removing excess liquid on the rod and head of a cosmetics applicator, comprising:

a plug body having an axial opening therethrough;

a resilient wiper section extending axially from said plug body and having a lower wiper edge remote from said plug body, wherein said wiper section has at least one of a cut and slot therein extending axially from said wiper edge toward said plug body such that said wiper edge forms a radially enlargeable wiper opening adapted to be resiliently held against the rod and head of a cosmetic applicator inserted therethrough, to remove excess liquid on the rod and head when the applicator is withdrawn axially through said wiper opening, wherein said at least one of a cut and slot is helical such that the action of withdrawing a cosmetics applicator through said opening



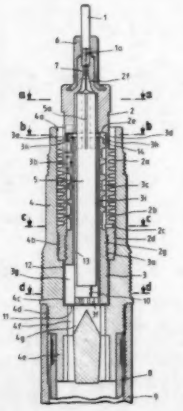
causes said lower wiper edge to be drawn in and around the rod and head of the applicator.

4,390,299

INDIA INK DRAWING IMPLEMENT

Otto Mutschler, Rudolf-Krehl-Strasse 21, Heidelberg, D-6900, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 297,739
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037257
Int. Cl.³ B43K *5/16, 1/06, 1/10*
U.S. Cl. 401—258 3 Claims



1. An India ink drawing implement comprising:

(a) a retaining box having an outer end and an inner end, the retaining box having a circumference and defining an axial bore and a shoulder in the axial bore, the retaining box comprising

(1) a spiral ink collecting system extending along the circumference of the retaining box,

(b) a retainer tube for a floating weight defining an axial bore in axial alignment with the axial bore of the retaining box, the retainer tube comprising

(1) an elongated tubular portion having a circumference and extending through the retainer box bore, the tubular portion having an annular outer end engaging the shoulder and defining an annular groove and a port,

(2) another spiral ink collecting system extending along

the circumference of the tubular portion, the ink collecting systems being connected by another port at an inner end thereof and the other ink collecting system having an outer end at the shoulder, the shoulder and the axial bore of the retaining box forming a duct defining an ink flow control path connected to the annular groove by the port in the outer end of the tubular portion, and

(c) a floating weight guided for axial movement in the axial bore of the retainer tube and a portion of the retaining box bore, the length of the tubular portion being sufficient to guide a major portion of the floating weight and the bottom of the retainer tube limiting the stroke of the axial movement of the floating weight,

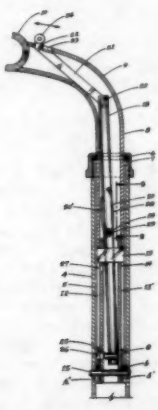
(1) the retainer tube bore having air conducting capillary passages spanning the stroke of the axial movement of the floating weight and in communication with the annular groove.

4,390,300

ADJUSTABLE BICYCLE HANDLEBAR STEM

Edwin E. Foster, 1801 Camp Craft Rd., Austin, Tex. 78746

Filed Aug. 21, 1980, Ser. No. 179,940
Int. Cl.³ B62K *21/22*
U.S. Cl. 403—24 **7 Claims**



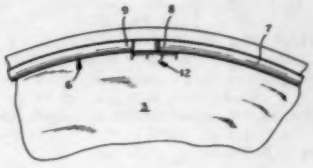
1. In a bicycle having a handlebar and a frame with a front fork tube, the improvement comprising a stem with its lower portion in said fork tube within which tube said stem is slidable, said stem having an upper portion extending above said fork tube and projecting forwardly thereof, means securing said handlebar to said stem upper portion on the forward end portion thereof, a stationary tube provided within said fork tube, means fixing said stationary tube to said fork tube for preventing relative movement of the former, said stationary tube being disposed coaxially with, and interiorly of, said stem lower portion, a lever disposed within said stem, means pivotally mounting said lever for rockable movement about an axis transverse to said stem, a latching pin carried on said lever, and at least one latch opening provided in said stationary tube for accepting said latch pin for maintaining said stem in preselected vertical relationship to said fork tube, said lever being thereby rockable between latch pin locked and unlocked condition.

4,390,301

FRICTION CONNECTION BETWEEN A WHEEL AND A SHAFT WITH FORCE INDICATOR

Werner Winckelhaus, Manteuffelstrasse 13, D-4100 Duisburg, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,541
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3036979
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—27 **6 Claims**



1. A device for frictionally coupling a hub to a shaft, comprising:

an annular disk surrounding said shaft and adapted to support radial force;

wedge means including at least one axially displaceable member surrounding said shaft and shiftable for transforming axial force into radial forces which are applied to said disk tending to expand said disk and to frictionally couple said hub and said shaft;

a plurality of screws angularly equispaced about said shaft and generally parallel thereto for axially displacing said member and applying said axial forces thereto; and

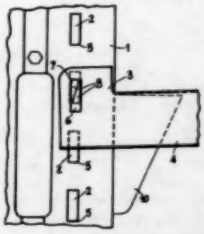
means on said disk for signaling the degree of expansion thereto, thereby indicating the radial force with which said hub is frictionally coupled with said shaft.

4,390,302

FRAMEWORK FOR FIXEDLY SUPPORTING A HORIZONTAL ARM

Jaime Sanfeliu-Marimon, Barcelona, Spain, assignor to Storage Systems and Industrial Products Ltd., Zurich, Switzerland

Filed Feb. 4, 1981, Ser. No. 231,443
Claims priority, application Spain, Feb. 5, 1980, 488925
Int. Cl.³ F16B *7/08, 9/00*
U.S. Cl. 403—187 **3 Claims**



1. A framework including a generally vertically extending elongated member for fixedly supporting a substantially horizontally extending arm from a transversely extending member at one of a plurality of locations comprising:

an extending member having a plurality of longitudinally separated rectangular openings;

an arm extending transversely to said member and having a rectangular opening aligned with one of the openings of said vertical member; and

a pair of cotter pins of right triangular cross section extend-

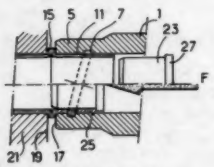
ing through said one opening and one of said openings of said member, said pins being in contact along the hypotenuses of the triangular sections and having dimensions along the other two sides less than the corresponding dimensions of said openings whereby after insertion of said pins through said openings said arm moves downward by gravity misaligning said openings by forcing said triangular members toward a superposed position in which they are wedged against each other and the surrounding surfaces of the openings and lock said arm to said member.

4,390,303

TORQUE TUBE-TO-UNIVERSAL JOINT YOKE DEFORMATION COUPLING

Bernard Mallet, Limay, France, assignor to Nadella, France

Filed Aug. 4, 1981, Ser. No. 290,019
Claims priority, application France, Aug. 6, 1980, 80 17338
Int. Cl.³ B25G 3/28; F16G 11/00
U.S. Cl. 403—284 3 Claims



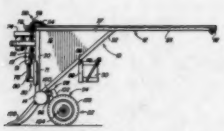
1. In a transmission device comprising a coupling including a cylindrical hub which has a longitudinal axis and defines a bore, and a tubular element which has a cylindrical end portion which is axially and circumferentially fixed in said bore and has for this purpose at least one radial boss obtained by an upsetting of the material of the tubular element and engaged in a cavity formed in the bore of the hub; the improvement wherein said cavity is constituted by a groove forming a curve which has at every point thereof a tangent which is inclined relative to the axis of the hub.

4,390,304

CRUSHED ROCK APPLICATOR MECHANISM

Carl C. Jacobson, Jr., Tempe, and Mark C. Manning, Chandler, both of Ariz., assignors to Crafco, Inc., Chandler, Ariz.

Filed Apr. 5, 1982, Ser. No. 365,198
Int. Cl.³ E01C 19/20
U.S. Cl. 404—110 20 Claims



1. An applicator mechanism for applying a layer of particulate materials on a ground surface over which it is manually movable, said applicator mechanism comprising:

(a) a carriage including wheel means for manual manipulation in a forward direction along an intended movement path by an operator;

(b) an upwardly opening hopper structure supportingly mounted on said carriage for receiving a supply of particulate materials, said hopper structure having an elongated materials dispensing slot formed in the bottom thereof which is disposed to extend transversely of the intended movement path of said carriage;

(c) means on said hopper structure for selectively varying the length and width dimensions of the opening defined by the materials dispensing slot of said hopper structure to control the flow of particulate materials therethrough; and

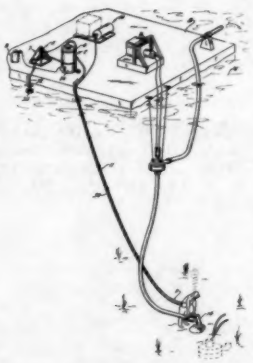
(d) said wheel means of said carriage being disposed in angularly downwardly and rearwardly spaced relationship with respect to the materials dispensing slot of said hopper and in substantially full ground surface engaging contact transversely of the intended movement path of said carriage for rolling over the materials dispensible from the materials dispensing slot when said carriage is moved forwardly along the intended movement path thereof.

4,390,305

PORTABLE HOT WATER SYSTEM FOR DIVER'S SUIT

Albert H. Sloan, 4200 Kean Rd., Fort Lauderdale, Fla. 33314

Filed Jan. 12, 1981, Ser. No. 224,007
Int. Cl.³ B63C 11/02; A61F 7/06
U.S. Cl. 405—186 3 Claims



1. A portable hot water system for a diver's suit and comprising a portable, air driven, pressure compensated, positive displacement water pump, said pump having a water inlet for receiving cold water and also having a pressurized water outlet, said portable pump being positionable adjacent said water source and having a cold water inlet conduit connected to its water inlet and for conducting cold water from a water source into said pump, an engine driven portable air compressor connected with and for driving said pump by compressed air, a portable water heater, a portable container of heating fuel which is connected with and for heating said heater, a cold water conduit between said water outlet of said pump and said water heater for supplying cold water to said heater, a hot water conduit from said hot water heater to the suit of a diver, and a thermostatic valve located in the water conduit between said water heater and said diver's suit.

4,390,306

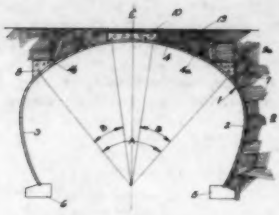
COMPOSITE ARCH STRUCTURE

Christopher L. Fisher, Winnipeg, Canada, assignor to Armco Inc., Middletown, Ohio

Filed Jan. 28, 1981, Ser. No. 229,079
Int. Cl.³ F16L 9/22; E01G 5/06; E21D 9/00
U.S. Cl. 405—124 20 Claims

1. In a composite arch structure of the type comprising an elongated, relatively thin gauge liner with compacted backfill thereabout, said liner comprising first and second flexible retaining wall portions and a flexible top arch portion extending therebetween, said first and second retaining walls having longitudinally extending upper edges, said top arch portion having longitudinally extending lateral edges affixed respectively to said upper edges of said first and second retaining wall

portions, the improvement comprising a stiffening and load distributing member structurally connected to said top arch



portion and extending centrally and longitudinally of said top arch portion for the majority at least of the length thereof.

4,390,307

PILE-DRIVING APPARATUS

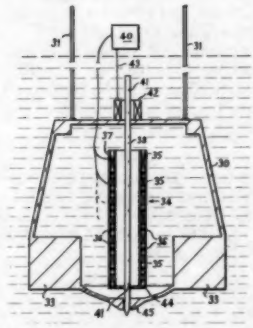
Alan R. Rice, 16 Falcon Ter., Wylam, Northumberland, England

Filed Aug. 15, 1980, Ser. No. 178,581

Claims priority, application United Kingdom, Aug. 17, 1979, 7928769

Int. Cl.³ E02D *7/06*; B25D *11/00*; E21B *7/26*

U.S. Cl. 405—228 **5 Claims**



1. In a non-percussive device for driving elements into soil, the improvement comprising:

(a) a linear electric motor including:

i. a motor stator comprising a stator tube provided by a plurality of coaxially arranged coils, the stator tube having a passage extending coaxially therethrough; and

ii. a motor slider, the slider itself comprising a non-percussive, non-reciprocating elongate soil penetrator element responsive to electromagnetic energy, said penetrator element, in operation of the device, extending through said passage with a clearance between the outer wall of said element and the inner wall of said stator tube which defines said passage and being slidable axially relative to said stator tube; and

(b) continuous axially-unidirectional force-generating means for generating a magnetic wave which travels along the coils of said stator tube, undirectionally, from one end thereof to the other, for inducing electrical currents in said coil penetrator element so as to set up a magnetic field which interacts with the field of said stator tube and imparts directly to said soil penetrator element a continuous, unidirectional driving force to slidably progressively displace said penetrator element through the stator tube in one axial direction only.

4,390,308

ADVANCE MECHANISM FOR A MINE ROOF SUPPORT ASSEMBLY

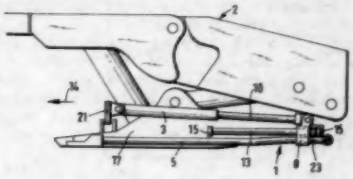
Kunibert Becker, Werl; Rüdiger Kirchbrücher, Dortmund-Brackel; Günter Lagodka, and Klaus-Dieter Pohlmann, both of Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,826

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034645

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—299 **22 Claims**



1. An advance mechanism for a roof support assembly comprising a plurality of roof support units positioned side-by-side along, for example, a longwall face of a mineral mining working, the advance mechanism comprising a pair of generally parallel hydraulic advance rams and a guide rod system including a pair of resilient, generally parallel guide rods, the guide rod system being attached, at one end, to a conveyor extending along the longwall face, the other end of each guide rod being attached to a respective slide piece which is slidably guided on a respective guide rail which is attached to a respective floor girder of a roof support unit, the slide pieces being attached to the piston rods of the hydraulic advance rams, wherein the cylinders of the hydraulic advance rams are attached to one of the adjacent floor girders, and the slide piece attached to the piston rod of one of the hydraulic advance rams is attached to the guide rod system.

4,390,309

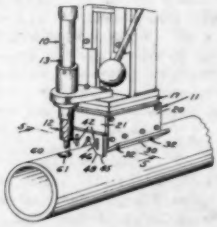
CRADLE PIPE ADAPTOR FOR MAGNETIC DRILL

Michael D. Fangmann, Bluegrass, Iowa, assignor to Jancy Engineering Co., Davenport, Iowa

Filed May 11, 1981, Ser. No. 262,539

Int. Cl.³ B23B *41/08*, *45/14*

U.S. Cl. 408—76 **4 Claims**



1. A cradle adaptor for use with a portable drill having an electromagnetic base for magnetically adhering the drill to a convex magnetic support surface, and wherein the electromagnetic drill base is rectangularly shaped and includes a flat bottom wall, a pair of opposite parallel side walls and a pair of opposite parallel end walls, characterized in that, said cradle adaptor includes:

(a) a rectangularly shaped box including a pair of laterally

spaced side plates and a pair of longitudinally spaced apart end plates which are adapted to be seated against the sides and ends, respectively of the rectangular electromagnetic drill base;

(b) means for releasably securing the side plates of the cradle box to the end plates for clamping the box on said drill base;

(c) a pair of adjustable side plates adjustably mountable on the outer faces of the cradle box side plates by a plurality of bolts extended through slots in the adjustable side plates into threaded engagement with mating threaded holes in the cradle box side plates;

(d) a pair of adjustable end plates adjustably mounted on the outer faces of the cradle box end plates by a plurality of bolts extended through slots in the adjustable end plates into threaded engagement with mating threaded holes in the cradle box end plates; and,

(e) means for releasably securing each of the adjustable side plates and the adjustable end plates to the adjacent respective cradle box side plates and cradle box end plates when the drill base is mounted on said convex support surface to have the adjustable side plates and adjustable end plates in magnetic line contact with the convex support surface.

4,390,310

TAPPING ATTACHMENT

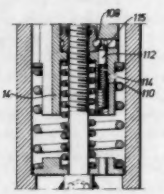
Alf Eriksson, Nacka, Sweden, assignor to Aktiebolaget Svenska Precisions verktyg, Sweden

Filed Jun. 20, 1980, Ser. No. 161,259

Claims priority, application Sweden, Jun. 20, 1979, 7905456

Int. Cl.³ B23B *47/24*

U.S. Cl. 408—141 **12 Claims**



1. A tapping attachment comprising one driving and one driven unit between which are provided means for the transfer of torque permitting mutual axial displacement of the two units, between which are mounted spring elements, one of which is tensioned when the units are moved away from one another and the other when the two units are moved in the opposite direction to this, in which adjustable stop elements mounted between the spring elements are so arranged as to limit the freedom of movement of the units toward or away from one another from an initial preset position determined by the tension of the springs, characterized further including pressure devices known per se acting upon the adjustable stop elements located between the spring elements in order to increase the resistance to axial displacement of the units towards one another regardless of the initial preset position of the units.

4,390,311

TOOL SUPPORT FOR TOOL MACHINES

Gerhard Kuhlmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

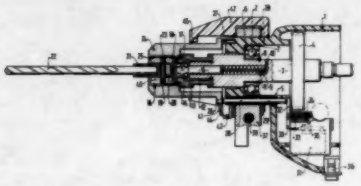
Filed Oct. 20, 1980, Ser. No. 199,108

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943501

Int. Cl.³ B23B *5/22*

U.S. Cl. 409—232 **9 Claims**

1. In a tool support for a machine tool, particularly for use in hand tool machines having a tool drive and transmission means adapted to operate under working pressures acting in a direction of an axis of rotation, the combination comprising a housing; a rotary drive spindle having a longitudinal axial recess, an inner tool-receiving sleeve having a first end portion received in said recess, an intermediate shaped portion connected to said first end portion for rotation therewith, and a second end portion adapted to receive a tool; biasing means located within said recess and adapted to bias said first end portion; an outer sleeve mounted on said second end portion and adapted for movement in the axial direction so that its position may be axially adjusted relatively to said spindle; and mounting means connected to said spindle and having an inner shaped surface corresponding to the surface of said shaped portion and adapted to receive said shaped portion for axial movement



therethrough so as to engage said shaped portion to provide coupling of said mounting means and said drive spindle with said inner sleeve when said spindle is rotated and to disengage from said shaped portion to uncouple said mounting means from said inner sleeve, said first end portion having such a length that the length of coupling engagement between said first end portion and said spindle is larger than the combined length of contact of said shaped portion with said inner shaped surface and a possible path of said outer sleeve in said axial direction, whereby when the tool is separated from a work piece being machined an uncoupling movement of said shaped portion from said mounting means begins.

4,390,312

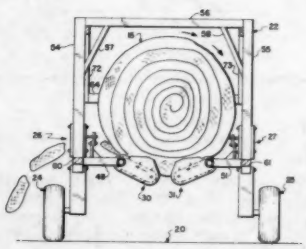
ROUND BALE TRANSPORTER AND FEEDER

Wayne B. Skeem, 1742 Targhee Dr., Twin Falls, Id. 83301

Filed Feb. 23, 1981, Ser. No. 237,088

Int. Cl.³ A01D *90/12*; B60P *1/02*

U.S. Cl. 414—24.6 **13 Claims**



11. A spirally wrapped, round bale transporter and feeder driven by a wheeled vehicle, the combination comprising:

a support frame having first and second ends and including a pair of spaced, parallel bale-supporting members;

means, located adjacent said second end of said support frame, for coupling said frame to the vehicle;

a plurality of wheels;

means for coupling said wheels to said support frame;

power means, coupled to said means for coupling said wheels to said support frame, for raising and lowering said support frame relative to said wheels to load bales onto said frame and unload bales from said frame; and

feeding means, coupled to said support frame adjacent said second end, for spirally unwrapping and feeding a round

bale supported on said bale-supporting members adjacent said second end transversely of said frame and onto the ground,

said feeding means comprising a pair of endless conveyor means, each having bale-gripping devices thereon,

said feeding means further comprising means for pivotally coupling said pair of endless conveyor means to said support frame and for moving said pair of endless conveyor means between a stowed position outboard of said bale-supporting members and a feeding position inboard of said bale-supporting members,

said means for pivotally coupling and for moving said pair of endless conveyor means comprising a hydraulic power device,

said means for pivotally coupling and for moving said pair of endless conveyor means further comprising

a pair of sprockets, each rigidly coupled to one of said pair of endless conveyor means,

a chain interconnecting said pair of sprockets, and

means for coupling said hydraulic power device to said chain.

4,390,313

METHOD AND APPARATUS FOR DEPACKING ARTICLES

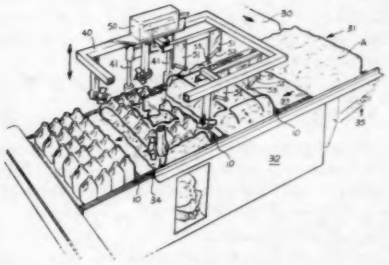
John W. Hoehn, 7 Webb St., Middle Brighton, Victoria, Australia

Filed Mar. 25, 1981, Ser. No. 247,274

Claims priority, application Australia, Mar. 27, 1980, 2942/80

Int. Cl.³ B65B *43/26*

U.S. Cl. 414—412 **14 Claims**



1. A method of removing articles from a package having a plurality of said articles arranged in parallel rows to provide a rectangular formation and retained within an envelope of flexible thermoplastic material, said method comprising positioning the package with the rows of articles supported on a horizontal base, forming two longitudinal and two transverse tear lines or splits extending substantially the full length and width of the package respectively, applying a force to a portion of the thermoplastic material bound by the four tear lines or splits along a line in a plane passing between two adjacent rows of articles and aligned with a slot in the base, forcing said portion of the thermoplastic material downwardly between the rows into contact with an under side region of the thermoplastics material of the package, continuing the application of said force after establishment of said contact to force a part of said portion and a part of the under side region of the package downwardly through said slot, and withdrawing all of the thermoplastic material of the package through said slot.

4,390,314

CONTAINER TRUCK FOR LIFTING AND CARRYING AWAY A CONTAINER

Lars G. Öberg, V. Frölunda, Sweden, assignor to Dynatruss AB, Hisings Backa, Sweden

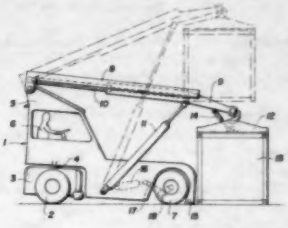
PCT No. PCT/SE80/00120, § 371 Date Dec. 12, 1980, § 102(e) Date Dec. 12, 1980, PCT Pub. No. WO80/02264, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 22, 1980, Ser. No. 220,048

Claims priority, application Sweden, Apr. 23, 1979, 7903524

Int. Cl.³ B60P *1/50*

U.S. Cl. 414—547 **1 Claim**



1. A four-wheeled container lift truck for lifting heavy loads onto the truck, comprising in combination, crane type means mounted on said truck for lifting up a container supported on a common surface with the truck into position on the truck body for subsequent transport, a single pair of truck wheels on an axle for supporting the truck on the surface being positioned near one end portion of the truck to be placed closely adjacent the container, and means for selectively moving an end load bearing portion of the truck at said one end adjacent to the container between said pair of wheels and the container to bear against the support surface for the truck during the lifting of the container to the transport position on the truck comprising a mechanism for lowering and raising said truck wheels to change the load supporting position between said wheel and said end portion of the truck body thereby to change the tipping center of the truck for permitting heavier containers to be lifted onto lighter weight trucks without counter weights.

4,390,315

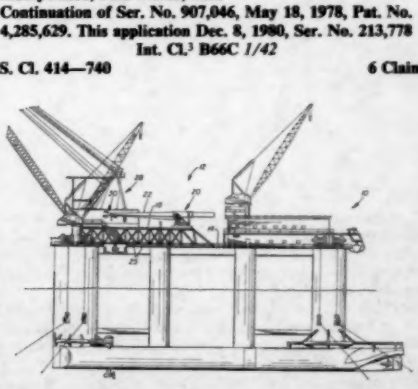
FIRE FIGHTING BOOM ASSEMBLY FOR SERVICE VESSEL

Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra Rig Incorporated, Fort Worth, Tex.

Continuation of Ser. No. 907,046, May 18, 1978, Pat. No. 4,285,629. This application Dec. 8, 1980, Ser. No. 213,778

Int. Cl.³ B66C *1/42*

U.S. Cl. 414—740 **6 Claims**



1. An extendable utility boom assembly for performing work

operations from a semi-submersible platform vessel comprising, in combination:

an extendable, elongated truss mounted for movement over the platform vessel from a stowed position to an operating position;

track means extending along the length of said truss;

a carriage assembly mounted for movement along the length of said track means;

a supporting frame pivotally mounted on the carriage assembly for angular movement in a horizontal plane;

a first linear actuator mounted on said carriage assembly and including an elongated drive assembly having teeth meshed with a circular gear secured to said supporting frame for driving said supporting frame in the horizontal plane;

a boom housing pivotally mounted on the supporting frame for angular movement in a vertical plane, said boom housing having wall portions defining a central axis passageway;

a second linear actuator interconnecting the boom housing and said supporting frame for displacing the boom housing about its axis in the vertical plane;

an elongated utility boom having a first hollow boom section telescopically coupled in the passageway of said boom housing for reciprocal movement through the boom housing and a second hollow boom section projecting axially out of the boom housing; and,

a third linear actuator interconnecting the boom housing and utility boom for reciprocating the utility boom along the axis of the boom housing.

4,390,316

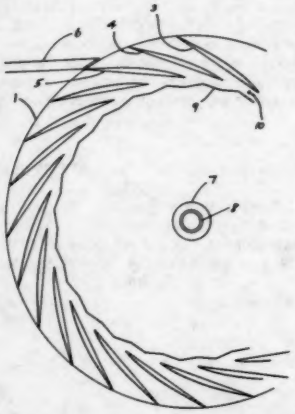
TURBINE WHEEL

John R. Alison, 4200 Massachusetts Ave., #117, NW., Washington, D.C. 20016

Filed Apr. 21, 1981, Ser. No. 256,182

Int. Cl.³ F01D *1/34*

U.S. Cl. 415—76 40 Claims



1. A turbine wheel with an integral fluid-dynamic multiple staging or compounding system useful for high as well as lower velocity applications, for extracting energy from at least one tangentially-entering stream of compressible or incompressible fluid, comprising:

a rotatable wheel structure closed on both sides transverse to its axis and closed on an inner circumferential periphery to form an annular passageway that is open on an outer circumferential periphery; and

a set of n blades with a fluid-dynamically-shaped profile mounted circumferentially at regular intervals one defined wheel sector apart between said transverse sides on said open outer periphery and suitably inclined and oriented so as to

(a) receive said entering stream inwardly between the blades of the wheel sectors that are spanned transiently by said stream such that the outermost segment of the leading edge of the particular one of said blades that is next in line to enter said stream during rotation becomes parallel to the first-encountered boundary of said entering stream no later than the instant that the blade makes contact with said stream, and

(b) define a discontinuous surface that will serve as an outermost effective fluidic capturing and constraining boundary of said annular passageway such that the cross-sectional area of said annular passageway is adequately large to pass said entering stream in its entirety, and

(c) vector said entering stream by the trailing surface of any blade that is receiving said stream and by the innermost leading surface of the neighboring blade, further inwardly and tangentially into said annular passageway such that the cross-sectional area of the entry passageway between this pair of adjacent blades, as transversely defined by the perpendicular distance s from the inner tip of the neighboring blade to the trailing edge of the receiving blade, to which said perpendicular can be drawn, is adequately large to pass that portion of said entering stream which is introduced between said adjacent pair of said blades, and

(d) capture and constrain said stream to continue flowing within said annular passageway by successive fluid-vectoring actions of the annular passageway trailing surfaces of said blades so long as said stream is moving faster than said blades, and

(e) receive the final vectoring force of said fluid on the outermost trailing surfaces of said blades as said fluid is exhausted radially outward by centrifugal force through said blades after losing enough velocity so said discontinuous surface no longer constitutes the outermost effective fluidic capturing and constraining boundary, and

wherein said fluid-dynamically-shaped profile of said blades is defined by

an acute angle α between the outermost segment of the leading edge of any blade and the outermost segment of the trailing edge of the blade, and

an obtuse angle δ between the outermost segment of the trailing edge and the first annular passageway segment of the trailing edge of the blade, and

wherein said first annular passageway segment spans about half of a wheel sector, and

an obtuse angle χ defining a blade peak between the first and second annular passageway segments of the blade, and

wherein said second annular passageway segment lies in the range between zero and the maximum length which does not block entry of the fluid into the annular passageway,

together with rounding of geometrically sharp surfaces to maintain durability, structural integrity, and streamline flow characteristics of the blade, and

wherein the inclination of said blades is defined by an acute angle β between the first annular passageway segment of the trailing edge of any blade and the tangential direction at the peak of the blade; and

means for fluid vectoring on said inner periphery of said annular passageway in a geometrically alternating and cooperative manner with respect to said successive fluid-vectoring actions of said blades.

4,390,317

SELF-PRIMING CENTRIFUGAL PUMP, IN PARTICULAR FOR CONVEYING LIQUIDS IN THE VICINITY OF THEIR BOILING POINT

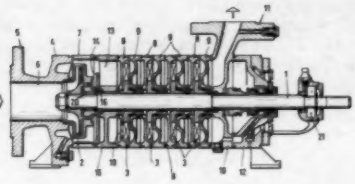
Wilfried Lehmann, Heiligenstedten, and Peter Fandrey, Glückstadt, both of Fed. Rep. of Germany, assignors to Sihi GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 288,901

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029604

Int. Cl.³ F04D 9/00

U.S. Cl. 415—143 8 Claims



1. Centrifugal pump having a first centrifugal pump stage, which is located on the suction side and is not self-priming, and having a pump inlet nozzle, which is located axially at the level of the horizontal shaft, and having at least one centrifugal pump stage, which is located downstream and which, operating with the aid of auxiliary liquid, is self-priming, characterised in that a liquid reservoir, of sufficient size, is arranged between two pump stages, the connection from this reservoir to the preceding centrifugal pump stage being located in the geodetically upper portion of the reservoir, and a seal for closing the shaft clearance being located between the liquid reservoir and the preceding centrifugal pump stage.

4,390,318

APPARATUS FOR OPERATING SHUT-OFF MEMBERS IN GAS TURBINE ENGINES, PARTICULARLY IN TURBOJET ENGINES

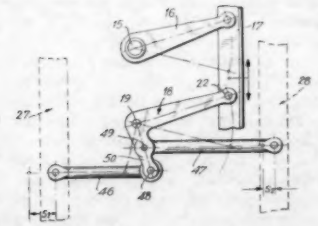
Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenche GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 940,492, Sep. 7, 1978, Pat. No. 4,253,797. This application Oct. 8, 1980, Ser. No. 195,073

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740904

Int. Cl.³ F04D 29/56

U.S. Cl. 415—145 2 Claims



1. Apparatus for controlling the movement of first and second shut-off members which can block and unblock gas-flow passages of a turbo engine to a selectable extent, comprising a first and a second shiftable pull rod each coupled to one of the shut-off members; a turnable actuating ring; a pair of bellcranks each having an elbow area swingable about a fixed pivot, and two free arms; means articulately connecting one of said free arms of each bellcrank to one of said rods; and means articulately connecting the other of said free arms of each bellcrank to said ring, said first and second pull rods each being connected to the respective bellcranks at different locations of the latter so that co-directional movement of the shut-off members results in different travel strokes of such members.

4,390,319

TURBINE EXHAUST HOOD

Anatoly V. Garkusha, ulitsa 23 avgusta 63, kv. 82, and Vladimir E. Dobrynin, pereulok Zernovoi, 6/4, kv. 49, both of Kharkov, U.S.S.R.

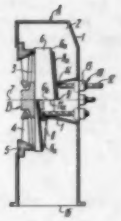
PCT No. PCT/SU80/00154, § 371 Date May 15, 1981, § 102(e) Date May 15, 1981, PCT Pub. No. WO81/00877, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 1, 1980, Ser. No. 263,997

Claims priority, application U.S.S.R., Sep. 25, 1979, 2210400

Int. Cl.³ F01D 25/30; F04D 29/56

U.S. Cl. 415—209 4 Claims



1. A turbine exhaust hood with a flow passage formed by the walls of a casing and having a guide member placed at its inlet and formed as a body of revolution with the longitudinal axis thereof being in line with that of the turbine and arranged so that one end thereof is disposed in close proximity with the outside ends of the turbine last-stage blade and accommodating a deflector mounted therein for longitudinal movement along the turbine axis and intended to change the flow area of the exhaust passage, characterized in that the deflector (8) is formed of a resilient material and has, when in initial position, a form of a ring (8) provided with at least one radial slit and positioned so that its axis is substantially aligned with the turbine axis (7), the deflector (8) being moved along the turbine axis (7) by means of a mechanism (10) connected with the deflector (8) in at least three points so that, with the turbine operating at reduced loads, the deflector (8) forms, together with the guide (6) and the wall of the casing (1), a volute-shaped converging channel (11) having its outlet section disposed at the slit (9) of the ring (8).

4,390,320

TIP CAP FOR A ROTOR BLADE AND METHOD OF REPLACEMENT

James E. Eiswerth, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

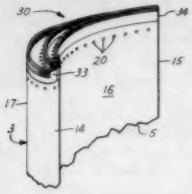
Filed May 1, 1980, Ser. No. 145,412

Int. Cl.³ F01D 5/18, 5/20

U.S. Cl. 416—97 R 14 Claims

9. A tip cap for a rotor blade including a radially outer end comprising a base portion for attachment with said rotor blade across said radially outer end and a plurality of ribs each extending radially outward from said base portion and including an abrasive material secured with a radially outer edge thereof, said ribs being dimensioned radially for positioning said abrasive material at varying radial distances from said base portion and beyond said radially outer end of said rotor blade for

providing said tip cap with stepped coatings of abrasive material such that as said abrasive material on each of said plurality



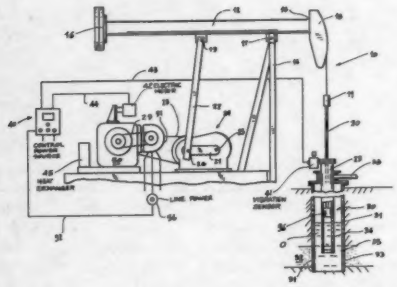
of ribs is worn away, said abrasive material on a next succeeding radially shorter rib becomes available for rubbing.

4,390,321

CONTROL APPARATUS AND METHOD FOR AN OIL-WELL PUMP ASSEMBLY

Henry J. Langlois, Detroit, Mich.; Dean W. Hart, Long Beach, Calif., and Gary J. Blazek, Livonia, Mich., assignors to American Davidson, Inc., Darborn, Mich.

Filed Oct. 14, 1980, Ser. No. 196,713
Int. Cl.³ F04B *49/10*
U.S. Cl. 417—15 **8 Claims**



1. A control apparatus for reducing oil-well pounding and preventing subsequent damage to a producing oil well and oil-well pump assembly, said control apparatus comprising:

fluid-drive means operatively coupled to said oil-well pump assembly;

a vibration-sensor means operatively coupled to said oil-well pump assembly to detect shock pulses generated during the pump cycle of said oil-well pump assembly and adapted to transmit the sensed shock pulses in the form of equivalent electrical signals to a control means which uses electric circuitry to determine the frequency of said equivalent electrical signals, and which control means transmits corresponding electrical step increase or step decrease signals as a predetermined electrical signal to an actuator means;

said control means being electrically coupled between said vibration-sensor means and said actuator means, said actuator means being operatively coupled to said fluid-drive means and being continuously responsive to said transmitted predetermined electrical signal from said control means to increase or decrease the rate of the pump stroke of the oil-well pump assembly depending upon said predetermined electrical signal received from said control means whereby optimum oil output is maintained while reducing the pounding to an acceptable level without shutting down the oil well so that subsequent damage to the operating oil well and oil-well pump assembly due to pounding is substantially eliminated.

7. A method for controlling pounding in an operating oil-well pump assembly without shutting down the oil well comprising:

sensing shock pulses generated by the oil-well pump assembly picked up by a vibration-sensor means and converting said shock pulses into equivalent electrical signals;

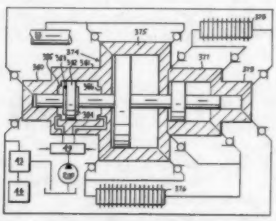
transmitting said equivalent electrical signals to a control means, determining at the control means the number of said equivalent signals received in a predetermined period of time by at least a divide by integrated circuit, converting said equivalent electrical signals to an electrical pulse of predetermined magnitude to step increase or step decrease an electrical signal and control the rate of the pump stroke by increasing or decreasing the speed of a fluid-drive means operatively coupled to said oil-well pump, and maintaining continuous and optimum oil output without an oil-well pump shutdown while reducing pounding to an acceptable level wherein subsequent damage to said oil well and oil-well pump assembly due to pounding is substantially eliminated.

4,390,322

LUBRICATION AND SEALING OF A FREE FLOATING PISTON OF HYDRAULICALLY DRIVEN GAS COMPRESSOR

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Filed Feb. 10, 1981, Ser. No. 233,217
Int. Cl.³ F04B *23/00, 3/00, 17/00*
U.S. Cl. 417—243 **7 Claims**



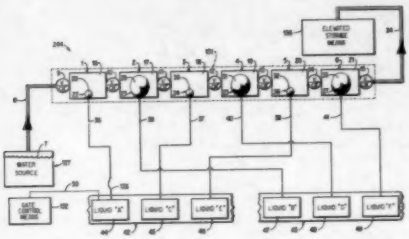
1. A double acting multicompression stage hydraulically driven gas compressor comprising a free floating piston assembly having a double acting low pressure gas compression piston means guided in first bore means defining first and second chambers each provided with gas inlet and outlet means, at least one double acting high pressure gas compression piston means guided in second bore means defining third and fourth chambers each provided with gas inlet and outlet means, and double acting hydraulic piston means guided in third bore means defining fifth and sixth chambers operable to transmit a reciprocating motion to said free floating piston assembly said fifth and sixth chambers being sequentially connected to a source of hydraulic pressure and exhaust means, first intercooler means between said gas outlet means of said first and second chambers and said gas inlet means of said third and fourth chambers, first seal means on said low pressure gas compression piston means, second seal means on said high pressure gas compression piston means and first pressure oil conducting duct means operable to conduct oil from said fifth or said sixth chamber whichever is pressurized at pressure higher than gas compression pressure in said third or fourth chamber to said second seal means, second duct means connecting said first intercooler means and said first seal means, and a gas to oil pressure translating means interposed in said second duct means.

4,390,323

MULTIPLE-STAGE SMALL TEMPERATURE DIFFERENTIAL HEAT-POWERED PUMP

Francis L. Burnham, Orangeburg, S.C., assignor to Orangeburg Technologies, Inc., Orangeburg, S.C.

Continuation of Ser. No. 242,242, Mar. 10, 1981, Pat. No. 4,347,045. This application Feb. 8, 1982, Ser. No. 347,034
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Int. Cl.³ F04B 25/00
U.S. Cl. 417—253 7 Claims



1. A pump system for pumping a first liquid from a source to an output facility comprising:

a. a multiple-stage pump comprising:

(1) a plurality of pumping stages; and

(2) a plurality of check valves, one of said plurality of check valves being located on the input and output of said multiple-stage pump and between each of said plurality of pumping stages;

b. each of said plurality of pumping stages comprising:

(1) a pressure chamber operable to hold said first liquid; and

(2) a flexible member within said pressure chamber operable, when expanded, to exert pressure against said first liquid and to force said first liquid from said pressure chamber through the one of said plurality of check valves between said pressure chamber and the next pressure chamber of the next subsequent pumping stage of said plurality of pumping stages or said output, if said pressure chamber is within the last of said plurality of pumping stages, when said pressure within said pressure chamber exceeds the next pressure in said next pressure chamber or said output;

c. each of said flexible members, connected to a container which is one of a plurality of containers; and

d. a plurality of vaporizable liquids, one of said plurality of vaporizable liquids contained within each one of said plurality of containers,

whereby each said container holds one of said plurality of vaporizable liquids and when said container is subjected to a hot temperature, said one of said plurality of vaporizable liquids vaporizes causing said flexible member to expand and when said container is subjected to a cold temperature, said one of said plurality of vaporizable liquids condenses causing said flexible member to contract,

wherein each said one of said plurality of vaporizable liquids which vaporizes into said flexible member has a higher pressure, when heated to said hot temperature, than the cold pressure of the next said one of said plurality of vaporizable liquids which vaporizes into the next flexible member within said next pressure chamber or to said output, if said flexible member is within said last of said plurality of pumping stages,

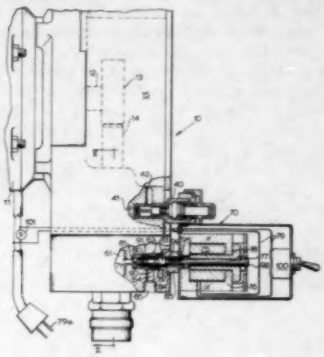
wherein connected to said plurality of pumping stages are a first heat exchanger and a second heat exchanger which utilize a hot liquid to provide said hot temperature and a cold liquid to provide said cold temperature.

4,390,324

PRESSURE RELEASE VALVE FOR PUMPS

Rudolf Karliner, Minnetonka, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Jan. 28, 1981, Ser. No. 229,168
Int. Cl.³ F04B 49/06
U.S. Cl. 417—282 3 Claims



1. A hydraulic column diaphragm pump comprising a housing containing a pumping chamber, a diaphragm dividing said chamber into a driving fluid chamber and a driven fluid chamber, a hydraulic fluid reservoir in said housing, means communicating the reservoir to the driving fluid chamber, means for loading and unloading the hydraulic fluid in the driving fluid chamber to reciprocate the diaphragm, pressure release means communicating the driving fluid chamber to the reservoir affective to release excess pressure in the driving fluid chamber by establishing communication between the driving fluid chamber and reservoir, said pressure release means being adjustable, an inlet to said driven fluid chamber, an outlet from said driven fluid chamber, said outlet from said driven fluid chamber including first passage means from said driven fluid chamber to a bore means, a second passage from said bore means to an outlet fitting, and a check valve in said bore means movable from a closed position blocking communication between said first and said second passages and an open position establishing communication between said first passage and said second passage, said check valve being normally biased to the closed position and being operable from the closed position to the open position upon the establishment of a condition in which pressure in the first passage is greater than pressure in the second passage, a third passage open to said bore means downstream of said check valve, said third passage open to second bore means through a variable orifice valve interpositioned between said third passage and said second bore means, a bypass conduit open to said second bore means downstream of said variable orifice valve, a valve actuator for said variable orifice valve, said valve actuator including a first movable member movable towards and away from a seat of said variable orifice valve, spring means urging said first movable member away from said seat, a solenoid having a second movable member, spring means interposed between said first movable member and said second movable member, urging said first movable member towards said seat, activation of said solenoid effective to move said second movable member toward said first movable member and to compress said second spring, compression of said second spring effective to overcome said first spring and cause said first movable member to block communication between said third passage and said second bore means at said seat with a closure force, said second movable member being position adjustable whereby the degree of compression of the second spring when said solenoid is actuated, is adjustable by adjustment of the position of the second movable member, adjustment of the compression of the

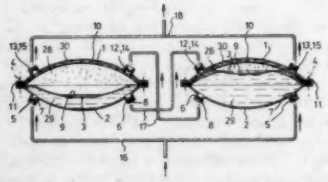
second spring effective to control said closure force, said third passage and said bypass conduit in communication through said second bore means when said variable orifice valve is open, motor means for driving said means for loading and unloading, circuit means for activating said motor means, second circuit means for activating said solenoid, said first circuit means and said second circuit means being interconnected whereby deactivation of said first circuit means deactivates said second circuit means, switch means for selectively deactivating said second circuit means independent of deactivation of said first circuit means, deactivation of said second circuit means causing movement of said second movable member away from said first movable member to a point where said first spring overcomes said second spring and opens said variable orifice valve, and said variable orifice valve being openable when said solenoid is activated by the presence of a pressure in said third passage acting against said first movable member at said seat which, combined with the force of said first spring overcomes said closure force.

4,390,325

PUMP DRIVEN BY THE RADIATION ENERGY OF THE SUN

Ari Elo, Turku, and Jorma Poikonen, Raisio, both of Finland, assignors to Elomatic Oy, Turku, Finland

Filed May 8, 1980, Ser. No. 147,733
Claims priority, application Finland, Nov. 13, 1978, 783447
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—379 **4 Claims**



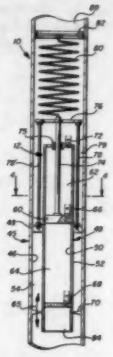
1. In a thermal pumping unit having a casing divided into two parts by an elastic membrane, one part containing a temperature sensitive evaporating-condensing fluid and the other part being a pumping space with intake and exhaust valves, the improvement of the part of the casing containing the temperature sensitive evaporating-condensing fluid being transparent to thermal radiation from the sun with the membrane having a heat absorbing surface on the side towards the transparent part of the casing such that the temperature sensitive evaporating-condensing fluid is completely subject to heat by direct and radiant sources and characterized by the addition of a cooling means, said cooling means having an input and an output, said cooling means condensing the evaporating-condensing fluid, and by the addition of a second substantially identical thermal pumping unit complete with cooling means, the exhaust valve of the first thermal pumping unit being connected to the input of said cooling means of the second thermal pumping unit and the exhaust valve of the second thermal pumping unit being connected to the input of said cooling means of the first thermal pumping unit, the matter being pumped by each unit cooling the evaporating-condensing fluid of the other unit speeding the cycling time of the thermal pumping units and substantially alternate the evaporating and condensing of their evaporating-condensing fluids.

4,390,326

DOWNHOLE PUMP HAVING A POWER PISTON AND A PRODUCTION PISTON

Jerry D. Callicoatte, 3206 W. Shandon, Midland, Tex. 79701

Filed Dec. 29, 1980, Ser. No. 220,816
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—401 **10 Claims**



1. In a pumping apparatus, an inner pump barrel, an outer pump barrel, an annular piston reciprocatingly received within said outer pump barrel, an inner piston reciprocatingly received within said inner pump barrel, means by which said annular piston is directly connected to be moved concurrently with said inner piston; energy storage means connected to store energy when one of said inner and annular piston are moved in a downward direction;

a fluid conduit connected to effect fluid pressure on said annular piston; said inner piston divides said inner barrel into a lower and upper chamber, check valve means by which reciprocation of said inner piston causes fluid to flow into said lower chamber and from said lower into said upper chamber and from said upper chamber into said fluid conduit;

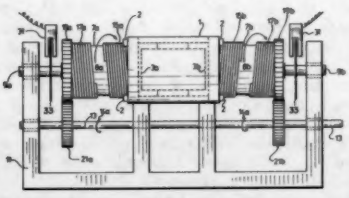
so that when fluid pressure is effected in one direction within said fluid conduit, said annular piston is forced to reciprocate and store energy, and when said fluid pressure is reduced, the stored energy forces the inner piston upwards thereby producing fluid which flows in another direction within said fluid conduit.

4,390,327

ALTERNATING ROTOR MOTOR WITH ROTOR POSITIONING SENSORS

Rudolf P. Picavet, 2629 Jane St., Downsview, Ontario, Canada

Continuation-in-part of Ser. No. 314,758, Oct. 26, 1981, Pat. No. 4,373,879. This application Apr. 19, 1982, Ser. No. 369,533
Int. Cl.³ F01C *1/063*
U.S. Cl. 418—35 **3 Claims**



1. A rotory motor comprising a housing, first and second co-axial opposing rotors rotatable within said housing, first and

second rotor shafts upon which first and second rotors are mounted respectively, a closed annular rotor chamber which is divided into power, exhaust, intake and compression regions by said rotors, ignition means for fuel combustion in the power region of said annular chamber for rotor rotation, a torque receiving shaft alternately driven by said first and second rotor shafts, a first anti-reversing spring clutch wound on said first rotor shaft and arranged to bind on said first rotor shaft for substantially preventing rotation in a first direction while allowing rotation of said first rotor shaft in a second direction opposite to said first direction, a first movable spring clutch wound around and adapted to bind on and rotate with said first rotor shaft when rotating in said second direction, a second anti-reversing spring clutch wound on said second rotor shaft and arranged to bind on said second rotor shaft for substantially preventing rotation in said first direction while allowing rotation of said second rotor shaft in said second direction, a second movable spring clutch wound around and adapted to bind on and rotate with said second rotor shaft when rotating in said second direction, drive means connecting said first and second movable spring clutches to said torque receiving shaft; said first an second rotors being adapted to alternately rotate in said second direction with said movable spring clutches providing, in turn, drive to said torque receiving shaft through each rotor shaft when rotating and providing slippage around each rotor shaft when each rotor shaft is prevented from rotating thereby enabling alternating rotation of said rotors, and sensing means for sensing position of said rotors, said sensing means comprising a pair of discs secured to said rotor shafts and being marked by a regular sequence of openings in each disc and magnetic pick-up members for magnetically picking up said openings.

4,390,328

MACHINE WITH ROTARY PISTON INCLUDING A FLEXIBLE ANNULAR MEMBER

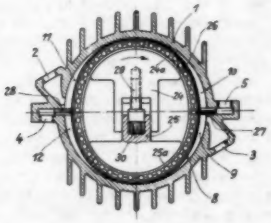
Kurt G. Fickelscher, Frankenthal, Fed. Rep. of Germany, assignor to P. A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen GmbH & Co., Stadthagen, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,437

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909228

Int. Cl.³ F01C *5/02, 5/06*

U.S. Cl. 418—45 **3 Claims**



1. In a fluid-flow machine

means defining a cylinder having an internal cylidrical surface and ports in that surface respectively for the admission and exhaust of fluid,

an assembly mounted within the cylinder including

two opposed, interconnected, parts, together rotatable relatively to the cylinder, each part having a peripheral surface with complementary curvature to that of the internal cylindrical surface of the cylinder and having the same centre as that of the cylinder,

means biasing the said parts towards the cylinder wall, and

a flexible ring interposed between the opposed parts and the said internal cylindrical surface and being pressed against said surface by the parts so that rotation of the parts causes non-slip relative motion between the ring and said surface, working space for the fluid being defined between the ring and said surface, and

means mounted on the cylinder dividing the working space into a fluid suction chamber and a fluid compression chamber,

the peripheral surface of each said part of the assembly being such that as the ring moves into contact with the portion of the internal peripheral surface of the cylinder defining the ports, surface to surface contact is maintained.

4,390,329

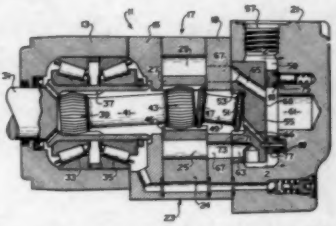
ROTARY FLUID PRESSURE DEVICE AND VALVE-SEATING MECHANISM THEREFOR

Clayton W. Thorson, Edina, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1980, Ser. No. 179,914

Int. Cl.³ F01C *1/10, 19/08;* **F16K** *25/00*

U.S. Cl. 418—61 B **8 Claims**



1. A rotary fluid pressure device comprising:

(a) housing means defining fluid inlet means and fluid outlet means;

(b) fluid energy-translating displacement means defining expanding and contracting fluid volume chambers;

(c) stationary valve means defining fluid passage means in fluid communication with said expanding and contracting volume chambers and having a first valve surface;

(d) a rotary valve member defining valve passage means providing fluid communication between said inlet and outlet means and said fluid passage means and having a second valve surface in sliding, sealing engagement with said first valve surface and further having an opposite surface;

(e) a valve-seating mechanism including a generally annular balancing ring member having a transverse valve-confronting surface in engagement with said opposite surface of said rotary valve member, and a balancing surface, said balancing ring member being axially movable relative to said rotary valve member, said valve-seating mechanism including means biasing said valve-confronting surface into tight sealing engagement with said opposite surface, said balancing ring member cooperating with said housing means and said rotary valve member to define a first fluid chamber disposed radially inwardly from said ring member and a second fluid chamber disposed radially outwardly from said ring member, said fluid inlet means being in fluid communication with one of said first and second chambers and said fluid outlet means being in fluid communication with the other of said first and second chambers;

(f) said valve-seating mechanism defining balancing passage means permitting fluid communication between said valve-confronting surface and said balancing surface;

(g) said valve-confronting surface defining inner and outer sealing land means disposed to restrict fluid communication from said first and second fluid chambers, respectively, to said balancing passage means; and

(h) said valve-seating mechanism including pressure-reduc-

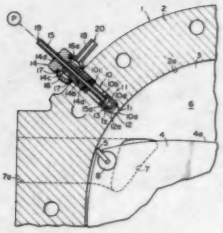
ing means operable to maintain the pressure differential between said valve-confronting surface and said balancing surface less than the equivalent force of said biasing means when fluid flow across one of said inner and outer sealing land means increases to a substantial portion of total flow from said fluid inlet means to said fluid outlet means.

4,390,330

LUBRICATING OIL SUPPLY MEANS FOR ROTARY PISTON ENGINES

Hiroshi Kodama, and Tadayuki Seto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Filed Aug. 26, 1980, Ser. No. 181,614
Claims priority, application Japan, Aug. 27, 1979, 54-109273
Int. Cl.³ F01C *1/22, 21/04;* F01M *1/04*
U.S. Cl. 418—97 **13 Claims**



1. A rotary piston engine including a casing which comprises a rotor housing having a trochoidal inner wall and a pair of side housings secured to the opposite sides of the rotor housing, a substantially polygonal rotor disposed in said casing for rotation with apex portions in sliding contact with the inner wall of the rotor housing to thereby define working chambers by flanks of said rotor and said inner wall of the rotor housing, lubricating oil supply means including oil supply port means opening at the inner wall of the rotor housing, bore means having an inner wall and formed in said rotor housing so as to lead to said oil supply port means, lubricating oil supply conduit means provided in said bore means, opening means provided in said bore means and having a cross-sectional area smaller than that of the oil supply port means, said opening means being opposed to said inner wall of the bore means for directing lubricating oil supplied through the conduit means against said inner wall of the bore means, and air passage means formed in said rotor housing and communicated with said bore means so as to provide air to a region of said bore means between said lubricating oil supply conduit means and said opening means.

4,390,331

POSITIVE DISPLACEMENT FOUR LOBE IMPELLER STRUCTURE

Paul W. Nachtrieb, 6392 Park Ave., Garden Grove, Calif. 92645

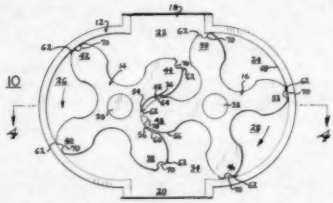
Filed Apr. 17, 1980, Ser. No. 140,450
Int. Cl.³ F04C *18/18, 27/00*
U.S. Cl. 418—141 **3 Claims**

1. A self-priming positive displacement two impeller pump, comprising:

a symmetrical generally elliptical cross-section cylindrical impeller housing having at opposite sides at least 180° arc cross-section interior walls separated by a relatively low pressure fluid inlet space coupled to a fluid entrance on the inlet side and a relatively high pressure fluid outlet space coupled to a fluid exit on the opposite exit side;

two axially parallel counter-rotating synchronously rotated cylindrical axially symmetric four lobe impellers, each impeller having a cross-section comprising four interior concave slightly elipsoid arc side walls disposed 90° apart and each elipsoid side wall forming half the base of two adjacent lobes of the four lobes, the interior arc lobe side wall connecting at an inflexion line to a convex arc cross-section tip having an arc radius equal to the impeller radius;

each impeller is 45° out of rotational phase with the other impeller and each impeller is coaxial with the axis of the at least 180° arc cross-section adjoining interior wall, has a radius incrementally less than the radius of the adjoining interior wall, such that adjacent lobes of each impeller during rotation define between themselves and the housing arc interior wall spaces which carry fluid from the fluid inlet area to the fluid outlet area, the impellers being selectively disposed apart such that the tips of each impeller fail by only an increment to touch the interior concave arc sidewall of the opposite impeller, thereby minimizing the fluid return space between the tips of each impeller and the interior concave side walls of the opposite impeller, the tips being sufficiently wide so that the exit side tip corner is maintained very close to the adjoining slightly elipsoid arc side wall during substantially all the first half of the passage past the slightly elipsoid arc side wall while the inlet side tip corner is disposed a relatively great, but



decreasing distance from the slightly elipsoid arc side wall, said distance being a function of the volume of fluid trapped in the fluid return space adjacent the slightly elipsoid arc side wall, and during substantially all of the second half of the passage the inlet side tip corner remains relatively close to the slightly elipsoid arc side wall while the exit side tip corner gradually increases its distance from the slightly elipsoid arc side wall, said distance being a function of the amount of fluid trapped in the fluid return space adjacent the slightly elipsoid arc side wall;

drive means coupled to axial shafts of the two impellers to rotate the two impellers in opposite directions;

bearings coupled to the axial shafts to reduce friction;

timing gear means coupled between the drive means and the axial shaft of the two impellers to maintain the two impellers 45° out of rotational phase with each other;

wherein each tip includes a fluid flow spoiler to increase fluid turbulence which reduces back flow by increasing sealing properties between the tip and the at least 180° arc cross-section adjoining interior wall; and

wherein the spoiler has a semi-circle concave cross-section and a diameter one-third the length of the arc which forms the tip, and the spoiler is centered at the center of the tip.

4,390,332

APPARATUS FOR INJECTION MOLDING OF PARTS FROM FOAM PLASTICS MATERIAL AND/OR FROM SOLID PLASTICS MATERIAL

James W. Hendry, Englewood, Tenn., assignor to KMMCO Structural Foam, Inc., East Detroit, Mich.

Filed Jul. 6, 1981, Ser. No. 280,598
Int. Cl.³ B29D *27/00;* B29F *1/05, 1/10*
U.S. Cl. 425—4 R **19 Claims**

1. An apparatus for molding during each cycle of operation (a) homogeneous plastics material and (b) foamed plastics material, the combination comprising:

a main passageway comprising a wall surrounding an extruding chamber and plasticizing means located in said main passageway for heating and plasticating a plastics material while simultaneously causing the plastics material to travel through said passageway from one end toward the other end thereof;

said main passageway having a melt zone followed by a melt and gas mixing zone;

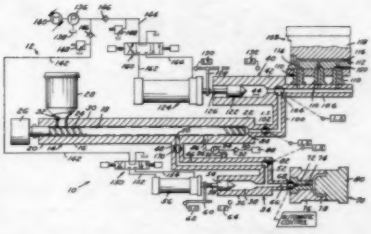
first injection means including a homogeneous plastics injection chamber;

second injection means including a foam plastics injection chamber;

first passage means connected on one end to the melt zone of said main passageway at a place upstream of said melt and gas mixing zone of said main passageway, said first passage means being connected on the other end thereof to said homogeneous plastics injection chamber;

a first flow control valve located in said first passage means, said first valve being opened during the time the homogeneous plastics injection chamber is being filled with homogeneous plastics material, and being closed after the measured amount of homogeneous plastics material has been stored in said homogeneous plastics injection chamber;

second passage means connected on one end to the melt and gas mixing zone of said main passageway downstream of the connection of said first passage means to said main passageway, said second passage means being connected on the other end thereof to said foam plastics injection chamber;



a second flow control valve located in said second passage means, said second valve being opened during the time the foam plastics injection chamber is being filled and being closed after the measured amount of foam plastics material has been stored in said foam plastics injection chamber;

means for introducing a gas or a gas emitting liquid or solid into the melt and gas mixing zone of said main passageway intermediate the connections of said first and second passage means to said main passageway where the gas mixes with the molten plastics material to form foamed plastics material;

means for energizing said plasticizing means and first directing the molten plastics material through said first passage means to said homogeneous plastics injection chamber for storing same in a measured amount generally corresponding to the molded weight of the homogeneous plastic part to be formed and second directing the molten foamed plastics material through said second passage means to said foam plastics injection chamber for storing same in a measured amount generally corresponding to the molded weight of the foamed plastic part to be foamed; and

fluid operated means for energizing said first and second injection means to discharge the plastics materials from their respective injection chambers to the corresponding molds for forming homogeneous plastics parts and foamed plastics parts;

said fluid operated means including means for operating said first and second injection means either simultaneously or sequentially to respectively direct the homogeneous and foam plastics material to the corresponding molds to make the homogeneous plastic parts and the foam plastic parts.

4,390,333

APPARATUS SUITABLE FOR USE IN CLOSING OPENINGS WITH A FOAM-EXPANDED BLADDER

Michel A. J. Dubois, Saint Pierre de Chandieu, France, assignor to Esso Societe Anonyme Francaise, Paris, France

Filed Feb. 5, 1981, Ser. No. 231,780

Claims priority, application France, Feb. 5, 1980, 80 02444

Int. Cl.³ B32B *35/00*

U.S. Cl. 425—11 **8 Claims**

1. Portable apparatus for use in closing a hole in a vessel, comprising

an expandable bladder of impervious elastic sheet material;

an elongated substantially rigid tubular rod for mounting the bladder at one end thereof so that the bladder can be manoeuvered into the hole from a distance from said hole by an operator at the other end thereof;

a source of settable foam plastic material constituents located within said one end of said tubular rod within said bladder, said source comprising at least two rupturable containers containing said constituents;

and operating means at the said other end of the rod for rupturing the said containers to allow their contents to mix and expand into a foam plastic material and thereby expand and fill the bladder within said hole.

4,390,334

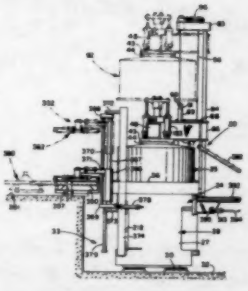
HYDRAULIC TIRE PRESS

Anand P. Singh, Youngstown, Ohio, and Daniel Shichman, Trumbull, Conn., assignors to NRM Corporation, Akron, Ohio

Division of Ser. No. 138,589, Apr. 9, 1980, Pat. No. 4,332,536. This application Apr. 14, 1982, Ser. No. 368,466

Int. Cl.³ B29H *5/02*

U.S. Cl. 425—28 R **17 Claims**



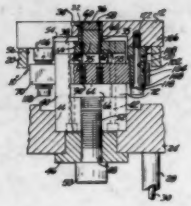
1. In a tire curing press a vertically extending sectional mold operator, means to move said operator vertically, and stroke limiting means for said operator comprising a rotatable stop ring presenting a stroke limiting physical stop for said operator, the limit of which physical stop is in response to the rotational position of the stop ring.

4,390,335

DIE, PUNCH AND CORE ROD ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Troy, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed Feb. 23, 1982, Ser. No. 351,482
Int. Cl.³ B30B *11/02, 15/02*
U.S. Cl. 425—78 7 Claims



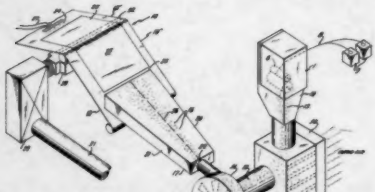
1. A punch and die assembly for a powder compacting press, said assembly comprising a stationary die plate, at least one reciprocable punch and at least one stationary core rod having an end slidably disposed in a bore through said punch, means reciprocably supporting said punch relative to said die plate, and means supporting said core rod at the other end in a stationary adjustable position relative to said die plate, said last mentioned means comprising a core rod support plate disposed below said punch, means attaching said other end of said core rod to said core rod support plate and means attaching said core rod support plate to said die plate, wherein said means attaching said core rod support plate to said die plate comprises a variable length spacer, said variable length spacer comprising a rotatable sleeve member having a peripherally threaded portion, a threaded bore in said core rod support plate accepting the peripherally threaded portion of said sleeve member, and a bolt passed through said sleeve member and threading at its end in a threaded aperture in said die plate for locking said sleeve member in position.

4,390,336

APPARATUS FOR AIR LAID FIBERGLASS MAT

B. Randall Ziegler, Freehold, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 121,941, Feb. 15, 1980, abandoned. This application Feb. 24, 1982, Ser. No. 351,795
Int. Cl.³ B29C *13/00*
U.S. Cl. 425—82.1 3 Claims



1. An apparatus for forming a fiberglass mat comprising,

means for directing chopped fiberglass strands in a moisturized air inducing means and then into the inlet and out of the exit of a blower means,

means within the blower means to partially open the chopped fiberglass strands into fiberglass partially opened strands, as well as means to direct the partially opened strands into a duct means,

the duct means being constructed to maintain a minimum uniform air velocity within the duct means for a given blower means exit velocity,

a foraminous conveyor means adjacent the duct means for the deposit of the partially opened strands in the form of a glass mat, and

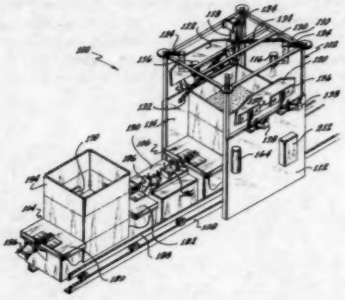
means located adjacent to the foraminous conveyor means to exert a vacuum force through the conveyor to hold the partially opened strands of the glass mat on the conveyor.

4,390,337

APPARATUS HAVING AN AUTOMATIC FOAM DISPENSING SYSTEM FOR FORMING SHOCK-ABSORBING MEMBERS IN A CONTAINER

Dana R. Gately, San Clemente, Calif., assignor to Sealed Air Corporation, Fair Lawn, N.J.

Filed Nov. 24, 1981, Ser. No. 324,456
Int. Cl.³ B29D *27/04*; B29C *1/04, 5/00, 7/00*
U.S. Cl. 425—89 16 Claims



1. A system for forming shock-absorbing members of cushioning material inside a container for the cushioning of an article to be provided therein, said system comprising a booth, a mold assembly movable between a first position outside of said booth and a second position within said booth, said mold assembly having means for supporting a container having an opening therein, dispensing means within said booth at said second position for dispensing said cushioning material into said container through said opening when said mold assembly is positioned within said booth underlying said dispensing means, and means for moving said mold assembly between said first and second positions while said dispensing means remains at said second position for dispensing said cushioning material into an incoming underlying container wherein said container has formed therein said shock-absorbing members of said cushioning material.

4,390,338

BLOW PIN ASSEMBLY

Kenneth E. Bowers, Prairie Village, Kans., and Charles E. Markley, Kansas City, Mo., assignors to Ethyl Development Corporation, Richmond, Va.

Filed Nov. 18, 1981, Ser. No. 322,422
Int. Cl.³ B29C *17/07, 17/10*
U.S. Cl. 425—525 10 Claims

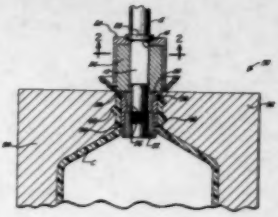
1. A blow pin assembly for use in blow molding extruded thermoplastic parisons to form containers having a neck finish, which assembly: provides a conduit for the passage of blow air to the extruded parison captured in a blow mold; effects removal of the neck moil associated with the captured extruded parison; and which forge forms structure on the inside surface of the neck finish, said blow pin assembly comprising:

a. a hollow, elongated blow pin stem, said blow pin stem being powered for rotation about its long axis;

b. a rotation collar for gripping said neck moil, said rotation collar being mounted to said blow pin stem whereby rotation of said blow pin stem about its long axis imparts rotative motion to said rotation collar;

c. a cutter collar mounted to said blow pin stem for pinching said neck moil against an anvil carried by said blow mold; and

d. a blow pin tip, having a die for the forge formation of said forge formed structure, said blow pin tip mounted to said



blow pin stem whereby said blow pin tip is free from following said rotation of said blow pin stem.

4,390,339

METHOD FOR REMOVAL OF FUNGI FORMED ON HIDES

Tokuyuki Taniguchi, Chiba; Iwao Yashima, Funabashi; Masanori Ota, Ichikawa, and Hitoshi Sasahara, Narashino, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,430

Claims priority, application Japan, Apr. 1, 1981, 56-48835; Nov. 20, 1981, 56-186454

Int. Cl.³ C14C *1/00*; D06L *3/06*

U.S. Cl. 8—94.18 10 Claims

1. A method for the removal of fungi from a hide suffering from fungous growth, comprising subjecting the hide to immersion in a solution containing chlorinated isocyanuric acid or salt.

4,390,340

TANNING AGENT, ITS PREPARATION AND ITS USE FOR RETANNING

Dietrich Lach, Friedelsheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

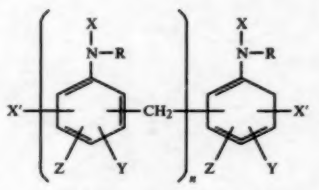
Continuation of Ser. No. 80,038, Sep. 28, 1979, abandoned. This application Jun. 30, 1981, Ser. No. 279,006

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843233

Int. Cl.³ C14C *3/18*; C08G *12/08*; C14C *3/16*; C07C *101/48*

U.S. Cl. 8—94.24 14 Claims

1. A tanning agent comprising a condensation product of an aliphatic C_1–C_4 aldehyde with an aromatic methylene sulfonic acid containing an amino group and having the formula



where X and X' are independently H, $—CH_2—SO_3H$ or $—CH_2—OH$, Y is H or $—CO_2H$ and Z is H, CH_3, R is H or C_{1-4}-alkyl and n is from 0 to 10, with the proviso that at least one methylene sulfonic acid group is present in the molecule.

4,390,341

COMPOSITION AND PROCESS FOR PRODUCING PIGMENTATION IN HAIR OR SKIN

Merle E. Jacobs, Goshen, Ind., assignor to Board of Overseers of Goshen College, Goshen, Ind.

Filed Dec. 29, 1980, Ser. No. 220,449

Int. Cl.³ A61K *7/13*, *7/42*, *7/021*

U.S. Cl. 8—424 6 Claims

1. A composition for coloring hair or skin comprising: (a) an effective amount of a tyrosyl derivative having a side chain not free for indolization, (b) an effective amount of an omega-amino acid having an aliphatic structure which includes from about three to about six carbon atoms, and (c) an effective amount of an oxidant for imparting a natural blond color to hair or a golden brown color to skin.

4. A method for imparting a natural blond color to hair comprising: (1) admixing an effective amount of a tyrosyl derivative having a side chain not free for indolization, an effective amount of an omega-amino acid having an aliphatic structure which includes from about three to about six carbon atoms, and an effective amount of an oxidant to produce an admixture capable of imparting said natural blond color to said hair; and (2) contacting said hair with an effective amount of said admixture to impart said natural blond color to said hair.

4,390,342

PROCESS FOR THE PREPARATION OF SOLID COMPOSITION OF WATER-SOLUBLE DYES

Beat Bruttel, Böckten, and Heinz Pfenninger, Lupsingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,696

Claims priority, application Switzerland, Apr. 1, 1980, 2565/80

Int. Cl.³ C09B *67/04*, *67/54*, *67/06*

U.S. Cl. 8—524 37 Claims

1. A process for producing a solid dye composition, which process comprises passing an aqueous solution or suspension of at least one water-soluble crude dye, to effect separation of synthesis by-products having molecular weights of below 500 and partial separation of water, through a semipermeable asymmetric membrane, containing ionic groups and the pores of which membrane having a diameter of 1 to 500 Å; subsequently drying the resulting aqueous preparation which has become more highly concentrate, wherein drying is performed in a granulating apparatus, a spray dryer or a fluidised bed apparatus; and adding a surface active agent before or after passage of the aqueous solution or suspension through the semipermeable membrane, the surface active agent being added beforehand only when it does not become separated by the membrane.

4,390,343

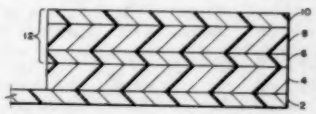
MULTILAYER ANALYTICAL ELEMENT HAVING AN IMPERMEABLE RADIATION DIFFUSING AND BLOCKING LAYER

Bert Walter, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 280,805, Jul. 6, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,632

Int. Cl.³ G01N *33/52*, *33/54*

U.S. Cl. 436—518 29 Claims



29. A method for detecting a ligand in or the ligand binding capacity of a liquid sample which method comprises contacting the sample with a multilayer analytical element of the type having a reagent layer incorporating reagents which are responsive to the ligand in or the ligand binding capacity of the sample to give a detectable response, a radiation diffusing and blocking layer, and a support layer, the improvement wherein the radiation diffusing and blocking layer is

(a) interposed between the reagent layer and the support layer;

(b) impermeable to the ligand, reagents of the reagent layer, and products of their interreaction; and

(c) inert to the ligand, reagents of the reagent layer, and products of their interreaction.

4,390,344

GASOHOL MAINTAINED AS A SINGLE MIXTURE BY THE ADDITION OF AN ACETAL, A KETAL OR AN ORTHOESTER

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,023
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 4 Claims

1. The method of stabilizing a composition containing a gasoline and a water-miscible alcohol which is miscible with said gasoline whereby said composition is inhibited from separating into more than one layer on contact with water which comprises mixing (i) said composition containing a gasoline and a water-miscible alcohol which is miscible with said gasoline, (ii) as an additive, an orthoester thereby forming a stabilized composition of increased water-tolerance which remains a single phase mixture at pH below 7 in the presence of water; and recovering said stabilized composition of increased water-tolerance.

4,390,345

FUEL COMPOSITIONS AND ADDITIVE MIXTURES FOR REDUCING HYDROCARBON EMISSIONS

Gabor A. Somorjai, 665 San Luis Rd., Berkeley, Calif. 94707

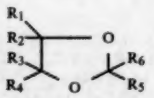
Filed Nov. 17, 1980, Ser. No. 207,371
Int. Cl.³ C10L 1/18
U.S. Cl. 44—63 18 Claims

1. As a composition of matter, a lead-free or substantially lead-free hydrocarbon fuel composition for use in a spark ignited internal combustion engine to reduce hydrocarbon emissions comprising

(i) a major amount of hydrocarbons boiling in the gasoline boiling range,

(ii) an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock compound, and

(iii) an exhaust emission reducing amount of a compound having the general formula:



wherein R_1–R_6 are each independently selected from hydrogen or hydrocarbyl radicals.

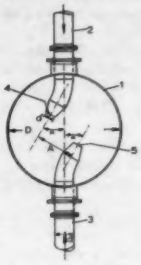
4,390,346

APPARATUS FOR MIXING AT LEAST ONE ADDITIONAL GAS INTO A MAIN FLOW OF GAS

Rudolph E. Cramer, Oudkarspel, and Johannes H. W. Ouwerkerk, Driehuis, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., Netherlands

Continuation of Ser. No. 145,744, May 1, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,200
Claims priority, application Netherlands, May 11, 1979, 7903708
Int. Cl.³ B01F 3/02
U.S. Cl. 48—180 R 7 Claims

1. Apparatus for mixing at least one additional gas into a main flow of gas, consisting of a cylindrical conduit having a flow passage and a wall bounding the flow passage to carry said main flow and two feed conduits in a single plane initially extending radially and opening into the cylindrical conduit with each having one opening therein, for the introduction of the said additional gas into the said main flow, the two openings of said conduits being spaced from the wall of the cylindrical conduit and arranged symmetrically with respect to the axis along the length of the cylindrical conduit and in said plane, said plane being perpendicular to said axis, the axes of the said openings being spaced apart from each other by less than one half of the internal diameter of the cylindrical conduit and the said openings being adapted to direct the additional gas in respective opposite parallel directions, so that the gas



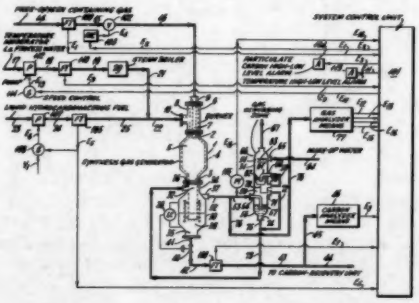
emerging from both openings tends to circulate in the same direction around the axis of the cylindrical conduit.

4,390,347

TRIM CONTROL PROCESS FOR PARTIAL OXIDATION GAS GENERATOR

Roger M. Dille, Port Arthur; Leigh R. Middleton, Beaumont, both of Tex.; Albert Brent, Huntington, N.Y., and Allen M. Robin, Anaheim, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,158
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R 17 Claims



1. In a partial oxidation process for reacting a liquid hydrocarbonaceous fuel feedstream and a free-oxygen containing gas feedstream in the presence of a temperature moderator in the reaction zone of a refractory lined free-flow noncatalytic gas generator at a temperature in the range of about 1700° to 3000° F. and a pressure in the range of about 1 to 300 atmospheres to produce an effluent gas stream comprising H_2, CO, CH_4, CO_2, particulate carbon and at least one material from the group consisting of H_2O, H_2S, COS, N_2, and Ar; and cleaning and cooling the effluent gas stream with water in a gas quenching and cleaning zone to remove substantially all of the entrained particulate carbon as a stream of carbon-water dispersion and to produce a cooled and cleaned effluent gas stream; the improved method for controlling the amount of unconverted particulate carbon in the effluent gas stream leaving the reaction zone comprising:

(1) periodically determining the flow rate of the feedstream of liquid hydrocarbonaceous fuel and generating a liquid hydrocarbonaceous fuel flow rate signal responsive thereto;

(2) automatically computing the desired rate of production for the unconverted particulate carbon produced in the reaction

zone, in accordance with the signal generated in (1) and a direct current voltage corresponding to the weight fraction of carbon in said liquid hydrocarbonaceous fuel times the desired weight fraction of carbon in the liquid hydrocarbonaceous fuel feed which is entrained as particulate carbon in the effluent gas stream leaving the reaction zone, and generating a corresponding signal responsive thereto;

(3) periodically determining the flow rate for the stream of carbon-water dispersion, and generating a corresponding carbon-water dispersion flow rate signal responsive thereto;

(4) automatically sampling and analyzing over a period of time a plurality of samples of the stream of carbon-water dispersion in succession, and generating corresponding signals responsive thereto each successive signal representing the weight fraction of particulate carbon;

(5) automatically storing and computing the average of said plurality of the signals generated in (4), and generating a corresponding signal responsive thereto representing the average weight fraction of particulate carbon;

(6) automatically computing the actual rate of production for the unconverted particulate carbon produced in the reaction zone and recovered in the carbon-water dispersion in accordance with the signals generated in (3) and (5), and generating a corresponding signal responsive thereto;

(7) automatically computing the relative difference between the actual and desired rates of production of unconverted particulate carbon in accordance with the signals generated in (2) and (6), and generating a corresponding signal responsive thereto;

(8) periodically determining the flow rate for the feedstream of free-oxygen containing gas, and generating a corresponding free-oxygen containing gas flow rate signal responsive thereto;

(9) automatically comparing the signal generated in (7) for a match with one of a plurality of direct current voltages corresponding to a series of values (+ and −) representing the relative difference between the actual and desired rates of production of unconverted particulate carbon, and responsive thereto providing a related signal corresponding to the % change to be made in the current flow rate for the free-oxygen containing gas feedstream in order to bring closer the current and desired flow rates for the free-oxygen containing gas, or alternatively providing a particulate carbon high or low level alarm signal;

(10) automatically multiplying the signal from (9) corresponding to the % change to be made in the current flow rate for the free-oxygen containing gas feedstream by a signal corresponding to the current flow rate for the free-oxygen containing gas feedstream to provide a signal to adjust the flow rate regulating means for the free-oxygen containing gas feedstream;

(11) automatically adjusting the flow rate of the free-oxygen containing gas feedstream, or alternatively actuating an alarm means in response to the signals generated in (10) or (9), respectively;

(12) stabilizing conditions in the reaction zone; and

(13) repeatedly cycling steps (1) to (12).

4,390,348

TRIM CONTROL PROCESS FOR PARTIAL OXIDATION GAS GENERATOR

Roger M. Dille, Port Arthur; Leigh R. Middleton, Beaumont, both of Tex.; Albert Brent, Huntington, N.Y., and Allen M. Robin, Anaheim, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,159

Int. Cl.³ C10J 3/46

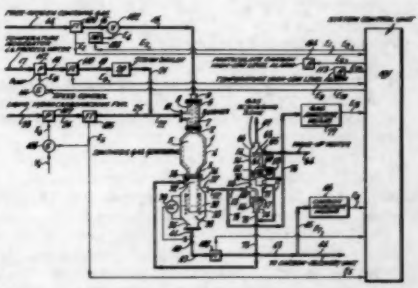
U.S. Cl. 48—197 R **16 Claims**

1. In a partial oxidation process for reacting a liquid hydrocarbonaceous fuel feedstream and a free-oxygen containing gas feedstream in the presence of a temperature moderator in the reaction zone of a refractory lined free-flow noncatalytic gas generator at a temperature in the range of about 1700° to 3000° F. and a pressure in the range of about 1 to 300 atmospheres to produce an effluent gas stream comprising H_2, CO, CH_4, CO_2, particulate carbon and at least one material from the group consisting of H_2O, H_2S, COS, N_2, and Ar; and cleaning and cooling the effluent gas stream with water in a gas quenching and cleaning zone to remove substantially all of the entrained particulate carbon as a stream of carbon-water dispersion and to produce a cooled and cleaned effluent gas stream; the improved method for controlling the amount of unconverted particulate carbon in the effluent gas stream leaving the reaction zone and for controlling the temperature in the reaction zone comprising:

(1) periodically determining the flow rate of the feedstream of liquid hydrocarbonaceous fuel and generating a liquid hydrocarbonaceous fuel flow rate signal responsive thereto;

(2) automatically computing the desired rate of production for the unconverted particulate carbon produced in the reaction zone, in accordance with the signal generated in (1) and a direct current voltage corresponding to the weight fraction of carbon in said liquid hydrocarbonaceous fuel times the desired weight fraction of carbon in the liquid hydrocarbonaceous fuel feed which is entrained as particulate carbon in the effluent gas stream leaving the reaction zone, and generating a corresponding signal responsive thereto;

(3) periodically determining the flow rate for the stream of carbon-water dispersion, and generating a corresponding carbon-water dispersion flow rate signal responsive thereto;



(4) automatically sampling and analyzing over a period of time a plurality of samples of the stream of carbon-water dispersion in succession, and generating corresponding signals responsive thereto each successive signal representing the weight fraction of particulate carbon;

(5) automatically storing and computing the average of said plurality of the signals generated in (4), and generating a corresponding signal responsive thereto representing the average weight fraction of particulate carbon;

(6) automatically computing the actual rate of production for the unconverted particulate carbon produced in the reaction zone and recovered in the carbon-water dispersion in accordance with the signals generated in (3) and (5), and generating a corresponding signal responsive thereto;

(7) automatically computing the relative difference between the actual and desired rates of production of unconverted particulate carbon in accordance with the signals generated in (2) and (6), and generating a corresponding signal responsive thereto;

(8) periodically determining the flow rate for the feedstream of free-oxygen containing gas, and generating a corresponding free-oxygen containing gas flow rate signal responsive thereto;

(9) automatically comparing the signal generated in (7) for a match with one of a plurality of direct current voltages corresponding to a series of values (+ and −) represent-

ing the relative difference between the actual and desired rates of production of unconverted particulate carbon, and responsive thereto providing a related signal corresponding to the % change to be made in the current flow rate for the free-oxygen containing gas feedstream in order to bring closer the current and desired flow rates for the free-oxygen containing gas, or alternatively providing a particulate carbon high or low level alarm signal;

(10) automatically multiplying the signal from (9) corresponding to the % change to be made in the current flow rate for the free-oxygen containing gas feedstream by a signal corresponding to the current flow rate for the free-oxygen containing gas feedstream to provide a signal to adjust the flow rate regulating means for the free-oxygen containing gas feedstream;

(11) automatically adjusting the flow rate of the free-oxygen containing gas feedstream, or alternatively actuating an alarm means in response to the signals generated in (10) or (9), respectively;

(12) stabilizing conditions in the reaction zone;

(13) periodically determining the current flow rate of the feedstream of temperature moderator and generating a signal responsive thereto;

(14) automatically sampling and analyzing over a period of time a plurality of samples of the cooled and cleaned effluent gas stream in succession and generating corresponding signals responsive thereto each successive signal representing the mole fraction of CH_4 (dry basis);

(15) automatically storing and computing the average of said plurality of signals generated in (14), and generating a corresponding signal responsive thereto representing the average mole fraction of CH_4 (dry basis);

(16) automatically computing a value representing the actual temperature in the reaction zone of the gas generator as a function of the methane concentration from the signal generated in (15) and direct input signals representing constants; and generating a corresponding signal responsive thereto;

(17) automatically computing the relative difference between the actual temperature as represented by the value derived in (16) and the desired temperature in the reaction zone, and generating a corresponding signal responsive thereto in accordance with the signal generated in (16) and a manual or automatically computed input signal representing the desired temperature in the reaction zone;

(18) automatically comparing the signal generated in (17) for a match with one of a plurality of direct current voltages corresponding to a series of values (+ and −) representing the relative difference between the actual temperature as represented by the value derived in (16) and the desired temperature in the reaction zone, and responsive thereto providing a related signal corresponding to the % change to be made in the current flow rate for the temperature moderator feedstream in order to bring closer the current and desired flow rates for the temperature moderator feedstream; or alternatively providing a reaction zone temperature high-low level alarm signal;

(19) automatically multiplying the signal from (18) corresponding to the % change to be made in the current flow rate for the temperature moderator feestream by a signal corresponding to the current flow rate for the temperature moderator feedstream from (13) to provide a signal to adjust the flow rate regulating means for the temperature moderator feedstream;

(20) automatically adjusting the flow rate of the temperature moderator feedstream, or alternatively actuating an alarm means in response to the signals generated in (19) and (18), respectively;

(21) stabilizing conditions in the gas generator; and

(22) repeatedly cycling the overall system control procedure as previously specified for controlling the amount of unconverted carbon in the effluent gas stream in steps (1) to (12), followed by adjusting the temperature in the reaction zone by steps (13) to (22).

4,390,349

METHOD FOR PRODUCING FUEL GAS FROM LIMESTONE

Cheng Jen-Tung, Taipei, Taiwan, assignor to Kuo-Yung Industrial Company, Taiwan

Filed Jun. 15, 1979, Ser. No. 48,815

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—197 R **6 Claims**

1. A method for the production of a gaseous fuel composition from a calcium carbonate-containing solid comprising:

thermally decomposing said calcium carbonate-containing solid at a temperature within the range of about 600° C. to about 900° C. to form calcium oxide and carbon dioxide;

reacting said calcium oxide and carbon dioxide with water and carbon at a temperature within the range of about 950° C. to 1300° C. to form a gaseous mixture of hydrogen, carbon monoxide, and at least one gaseous aliphatic hydrocarbon, said calcium carbonate-containing solid, carbon and water being employed in weight ratios suitable to produce a gaseous fuel composition consisting essentially of about 48 to 72 percent by weight of carbon monoxide, about 5 to 11 percent by weight of hydrogen and about 2.8 to 9 percent by weight of gaseous lower molecular weight hydrocarbons of 1 to 3 carbon atoms.

4,390,350

STERILIZATION OF BACTERIAL CONCENTRATES

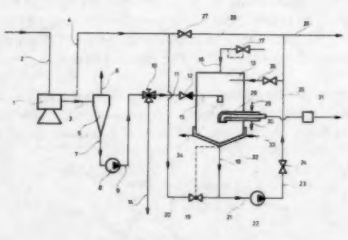
Bengt A. Palm, Genarp, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Sep. 21, 1982, Ser. No. 420,910

Claims priority, application Sweden, Sep. 22, 1981, 8105581

Int. Cl.³ B01D *19/00*; A23P *1/00*; C12C *7/18*

U.S. Cl. 55—38 **10 Claims**

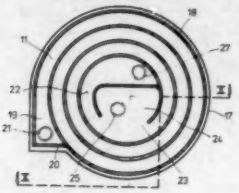


1. In the treatment of a liquid containing gases, such as air and carbon dioxide, and microbes, the process which comprises subjecting a stream of said liquid to centrifuging to separate it into a microbe-enriched partial stream and a flow of microbal-exhausted liquid, subjecting said partial stream to a first degassing to remove most of the gases therefrom, then feeding said partial stream into a closed container by way of a step which finely divides the partial stream, introducing steam into said container to heat said partial stream by direct condensation of the steam, discharging a heated partial stream through a first outlet of said container while controlling the liquid level in the container, separating from the liquid in said container residual gas in said liquid, and discharging the separated residual gas through a second outlet from the container.

4,390,351
GAS-LIQUID SEPARATOR

Kunio Matsui; Hiroaki Tsuchiya, both of Yokohama, and Ryushi Suzuki, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 117,524, Aug. 12, 1980, abandoned.
This application Oct. 20, 1981, Ser. No. 312,995
Claims priority, application Japan, Aug. 16, 1979, 54-104210; Apr. 24, 1980, 55-56523
Int. Cl.³ B01D *19/00, 45/16*
U.S. Cl. 55—204 1 Claim



1. A centrifugal separator for separating gas bubbles from a liquid in which such bubbles are trapped comprising:

a flow structure having an inlet for admitting a liquid having entrapped gas bubbles and comprising a top plate, a bottom plate parallel thereto and a strip spirally coiled between and having the edges thereof joined to said top and bottom plates, the inner end of said strip being joined to the innermost turn of said strip so as to define between the inner and outer ends of said strip a spiral passage having inlet and outlet ends and a central axis in a single plane and being of substantially uniform rectangular cross section and for a major portion of its length being bounded by imperforate walls defined by said plates and strip and confined between parallel planes defined by said plates and parallel to said single plane, whereby to subject the liquid received through said inlet to flow pattern forming a vortex and in which flow pattern separation is achieved by the liquid of relatively high specific gravity being centrifugally forced toward and confined by radially outward portions of said passage during travel along a major portion of the length thereof enabling the said gas bubbles of relatively low specific gravity to be forced toward and confined by radially inward portions of said passage during travel along said major portion of the length thereof, said inner end of said strip comprising a radially inward portion and being partially cut out to provide an opening in said radially inward portion near the outlet end of said passage so as to form a bubble trapping compartment adjacent said opening, said compartment communicating with a first outlet for removing bubbles separated from said liquid after travel along said major portion of the length thereof, and a second outlet communicating with said outlet end of said passage for removing the liquid free of those bubbles removed at said first outlet.

4,390,352
HEAT EXCHANGER

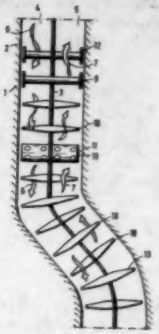
Ingo Grün, D-4300 Essen, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,354
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012286
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—208 6 Claims

2. A heat exchanger having at least two channels for the flow therethrough of fluids, comprising:

(a) a flexible wall having poor thermal conductivity characteristics;

(b) a plurality of heat conducting pins mounted in said wall, said pins extending through said wall on either side of said flexible wall, said pins being supported by said flexible wall and cooperating with said wall to form a seal, said flexible wall and said pins cooperating to preclude the transmission of heat along said flexible wall in the direction of fluid flow and facilitate heat transmission through

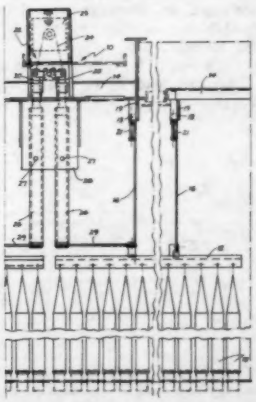


said flexible wall along said heat conducting pins between the channels, said pins being mounted in said flexible wall by pushing the pins through said flexible wall such that prefabricated holes adapted for receipt of the pins are unnecessary.

4,390,353
FILTER APPARATUS

Rodney W. Miljoen, Berowra Waters, Australia, assignor to James Howden Australia Pty. Limited, Australia

Filed May 14, 1981, Ser. No. 263,482
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—304 7 Claims



1. Filter apparatus for filtering particulate matter from a gas stream comprising a frame, a shaker rack suspended from the frame, a plurality of filter bags suspended vertically from the shaker rack, and shaker means for causing the shaker rack to move reciprocally along a path lying substantially in one plane, said shaker rack being suspended from the frame by a plurality of leaf springs which lie in parallel planes, which planes are normal to the plane containing the path of reciprocation of the shaker rack.

4,390,354

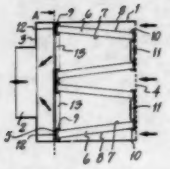
AIR FILTERS

Stanley P. Witchell, 17 Town Close Vicarage Hill, Dartmouth, South Devon, England

Continuation of Ser. No. 129,526, Mar. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 558,496, Mar. 14, 1975. This application Aug. 10, 1981, Ser. No. 291,858

Int. Cl.³ B01D 29/20, 29/24

U.S. Cl. 55—337 9 Claims



1. An air cleaner comprising at least two pleated paper filter elements each having the configuration of a frustum of a cone and mounted in side-by-side relation in a casing with their relatively wide diameter ends in sealing relation to a common, impregnable baseplate, means dividing said casing into two discrete portions, said baseplate means having openings defined therein to provide direct communication between one of said portions and the inside of said elements, impermeable means for closing the relatively narrow diameter ends of the elements, an aperture in the casing in each of said portions, and means defined by said casing to direct air entering into said casing tangential to the surface of said filters whereby in use, air entering one of said apertures can pass to the other aperture only through said filter element; said elements and means defined by said casing, being designed, positioned and dimensioned to provide maximum utilizable surface area on said elements while providing a minimum pressure drop through said casing.

4,390,355

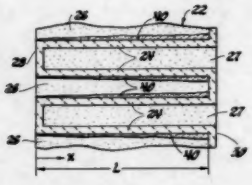
WALL-FLOW MONOLITH FILTER

Dean C. Hammond, Jr., Birmingham, and Paul T. Vickers, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1982, Ser. No. 345,005

Int. Cl.³ B01D 39/20; C04B 21/06

U.S. Cl. 55—523 2 Claims



1. A wall-flow diesel particulate filter for use in a diesel engine exhaust system, said filter comprising a ceramic monolith having a plurality of interlaced thin gas filtering porous internal walls defining a plurality of parallel aligned passages extending from an inlet end to an outlet end of the filter, said passages including a first group comprising inlet passages open at said inlet end and closed at said outlet end and a second group comprising outlet passages closed at said inlet end and open at said outlet end, the cross-sectional flow area of each said inlet passage substantially decreasing and the walls defining said inlet passage substantially increasing in thickness along its longitudinal length from said inlet end to said outlet end for the more uniform trapping of particulates on these walls during exhaust gas flow into said inlet passages and through said walls into associated, adjacent said outlet passages and the cross-sectional flow area of said outlet passages remaining constant.

4,390,356

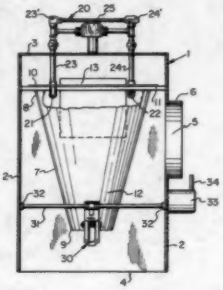
APPARATUS FOR PREVENTING SNOW BUILDUP IN A CARBON DIOXIDE SNOW CYCLONE SEPARATOR

Martin D. Preiss, Chicago, and Peter A. Students, Westchester, both of Ill., assignors to Cardox Corporation, San Francisco, Calif.

Filed Oct. 2, 1981, Ser. No. 307,921

Int. Cl.³ F25J 1/00

U.S. Cl. 62—35 13 Claims



1. A cyclone separator for generating snow from liquid carbon dioxide comprising a flexible frustoconical member defining a separation chamber, said frustoconical member having a partially open upper end and an open lower end, means supporting said frustoconical member in an inverted position with its longitudinal axis oriented vertically, a plurality of injection nozzles located in the upper end of said separation chamber and radially spaced inwardly from the walls of said frustoconical member, each of said injection nozzles having an orifice for injecting liquid carbon dioxide into said separation chamber, the orifice of each of said nozzles being directed outwardly toward the walls of said frustoconical member, whereby liquid carbon dioxide injected into said separation chamber forms a mixture of snow and vapor which directly impinges against the walls of said frustoconical member to create induced vibrations therein to reduce carbon dioxide snow buildup and wherein the combined actions of centrifugal force and gravity separate snow from vapor permitting the snow and the vapor to be discharged from said open lower end of said frustoconical member.

4,390,357

METHODS OF AND SYSTEM FOR CLEAN AIR DELIVERY TO LIGHTGUIDE FIBER DRAWING APPARATUS

Daryl L. Myers, Lawrenceville, and Stanley Rice, Atlanta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,166

Int. Cl.³ C03B 37/025

U.S. Cl. 65—2 14 Claims

7. A method of providing air having a predetermined cleanliness to drawing apparatus in which lightguide fiber is drawn from a preform, said method including the steps of:

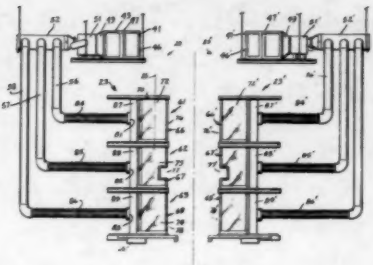
providing a flow passage having a first end which communicates with air that is ambient to the drawing apparatus and having a second end which is adjacent to the preform and the fiber, said flow passage being arranged to direct air transversely of the fiber and the preform;

surrounding a portion of the preform and of the fiber with an

enclosure which communicates with the second end of the flow passage and which has an opening that is opposite to the second end of the flow passage; and

causing ambient air to be drawn into the first end of the flow passage, moved through the flow passage into the enclosure and directed in a substantially laminar flow transversely past the portions of the fiber and preform which are surrounded by the enclosure, and then through the opening; while

filtering the air which is moved through the flow passage to remove contaminants and to cause the air that is directed past the fiber and the preform to have a predetermined cleanliness.



4,390,358

METHOD AND APPARATUS FOR THE TRANSPORT OF GLASS PANES

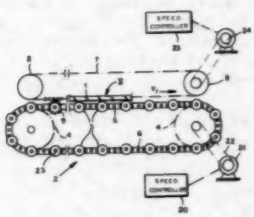
Horst Frielingsdorf, Am Meisenhort 2, 5630 Remscheid 11, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,124

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113409

Int. Cl.³ C03B 25/08

U.S. Cl. 65—111 **10 Claims**



1. In an apparatus for the treatment of glass panes wherein a heated glass pane is displaced in a transport direction through a treatment stage, the improvement which comprises:

a traveling endless grate having an upper pass adapted to support said panes and form with a multiplicity of rollers on which said panes rest;

means for displacing said grate so that said upper pass moves continuously at a velocity V_{grate};

means for imparting an angular velocity ω to said rollers such that said rollers impart a velocity component ωR to said panes, where R is the radius of said rollers so that said glass pane moves through said stage without sagging at a translatory velocity $V_{trans}=V_{grate}-\omega R$, when V_{grate} is greater than ωR and with a velocity $V_{trans}=\omega R-V_{grate}$, when ωR is larger than V_{grate}, said component ωR being in the direction opposite V_{grate}.

8. A method of operating a roller grate for the transportation of heated panes through a treatment stage, comprising the steps of:

continuously displacing said grate at a velocity V_{grate};

independently rotating said rollers at an angular velocity ω whereby said rollers impart velocity component ωR to glass panes carried by said rollers on said grate; and

controlling said velocities so that ωR is in a direction opposite V_{grate}.

4,390,359

METHOD OF AND APPARATUS FOR PREVENTING THE CURVING OF GLASS SHEETS IN THE ROLLER-EQUIPPED FURNACE OF A HORIZONTAL TEMPERING PLANT

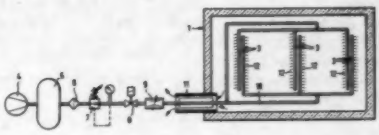
Pauli Reunamäki, Nattari, Finland, assignor to Tamglass Oy, Tampere, Finland

Filed Sep. 8, 1981, Ser. No. 300,374

Claims priority, application Finland, Sep. 12, 1980, 802866

Int. Cl.³ C03B 27/04

U.S. Cl. 65—114 **13 Claims**



1. A method for the prevention of curving of glass sheets in the roller-equipped furnace of a horizontal tempering plant, wherein the glass sheets are passed in a horizontal plane, by means of a conveyor consisting of horizontal rollers, through a furnace, the opposite surfaces of the glass sheet being subjected to the conduction, convection and radiation heat action produced by resistance elements, rollers and the like furnace components disposed above and below the glass sheet, characterized by the step of blasting air so as to create on the upper surface of the glass sheet a substantially turbulent air flow for intensifying the convection heat action applied to the upper surface of the glass-sheet, the air being blasted by injection action near the upper surface of the glass sheet by narrow jets spaced along the length of the furnace and being directed at certain distances against each other for the creation of short circulating flows longitudinally of the furnace.

4,390,360

CONTROL OF SICKLEPOD, SHOWY CROTALARIA, AND COFFEE SENNA WITH A FUNGAL PATHOGEN

Harrell L. Walker, Stoneville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 10, 1982, Ser. No. 356,870

Int. Cl.³ A01N 63/04

U.S. Cl. 71—79 **4 Claims**

1. A method for controlling multiple plant weeds of sicklepod, showy crotalaria, and coffee senna, comprising inoculating an agricultural field with an effective amount of fungus *Alternaria cassiae* to produce typical lesions in and kill said multiple weeds.

4,390,361
PROCESS FOR PREPARING FERROMAGNETIC PARTICLES COMPRISING METALLIC IRON

Toshinobu Sueyoshi, Kyoto; Shigeo Hirai, Shiga, and Masahiro Amemiya, Osaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jun. 11, 1981, Ser. No. 272,722
Claims priority, application Japan, Jun. 11, 1980, 55/79417; Jun. 11, 1980, 55/79418; Jul. 11, 1980, 55/95403
Int. Cl.³ B22F 1/00; A01F 1/02
U.S. Cl. 75—0.5 BA 12 Claims

1. A process for preparing ferromagnetic iron particles comprising metallic iron as the major component by reduction of particles of an iron oxide under heating, said process comprising:

providing iron oxide particles with a first coating layer containing at least one metal compound selected from the group consisting of aluminum compounds, zinc compounds and alkaline earth metal compounds;

providing the thus prepared metal compound coated particles with a second coating layer containing at least one silicon compound; and

subjecting the thus prepared coated particles to reduction under heating.

12. A ferromagnetic iron particle comprising:

an iron oxide particle having coated thereon a first coating layer and an outer second coater layer;

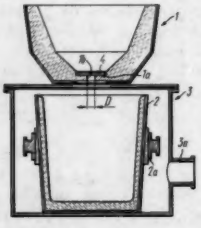
said first coating layer containing at least one metal compound selected from the group consisting of aluminum compounds, zinc compounds and alkaline earth metal compounds; and

said outer second coating layer containing at least one silicon compound.

4,390,362
METHOD AND APPARATUS FOR OUT-OF-FURNACE TREATMENT OF CAST IRON

Gil D. Khusnutdinov, prospekt Vernadskogo, 81, kv. 35; Arkady V. Chernovol, ulitsa Pushkinskaya, 5, kv. 8; Vladimir S. Shumikhin, ulitsa M.Koshevogo, 24, kv. 123; Vasily T. Shulga, ulitsa Schuseva, 3, kv. 3, all of Kiev; Andrei I. Poteiko, ulitsa Zarya, 4, kv. 10; Vladimir K. Kamensky, Gorki-2, ulitsa Rikharda Zorge, 67, kv. 77, both of Kazan; Jury A. Kondakov, ulitsa Rykova, 1/23, kv. 45, and Viktor G. Shmigidin, prospekt Vernadskogo, 81, kv. 119, both of Kiev, all of U.S.S.R.

Filed Nov. 9, 1981, Ser. No. 319,613
Int. Cl.³ C21C 7/10
U.S. Cl. 75—49 12 Claims

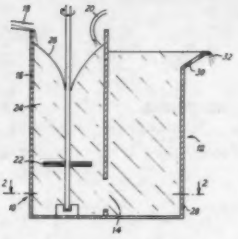


1. A process of treating molten cast iron out-of-the-furnace, comprising the steps of supplying a ladle with innoculant additives for said molten cast iron, placing said ladle within a substantially enclosed chamber, applying a continuous source of vacuum to said chamber, feeding a stream of molten cast iron to said ladle within said chamber, said stream of molten cast iron being subjected to said vacuum source prior to its interaction with the additives in said ladle, and maintaining said molten cast iron so fed to said ladle under said vacuum source for a period of 15 to 120 seconds.

4,390,363
CONTINUOUS METHOD FOR REMOVING COPPER FROM LEAD

John E. Bowers, Oxford, England, assignor to B.N.F. Metals Technology Centre, Oxfordshire, England

Filed Jun. 11, 1981, Ser. No. 272,523
Claims priority, application United Kingdom, Jun. 18, 1980, 8019930
Int. Cl.³ C22B 13/06
U.S. Cl. 75—63 10 Claims

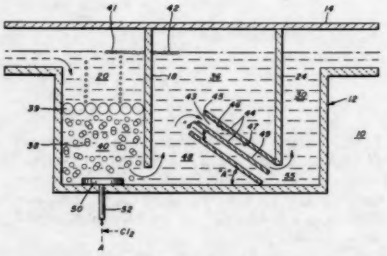


1. A continuous method of removing copper from lead by reaction of copper with sulfur in a single stirred reaction vessel in which the materials introduced into the vessel are maintained under non-homogeneous conditions, which method comprises introducing a stream of lead containing copper as an impurity to the upper end of a vertical stirred reaction vessel, feeding sulphur into the stream of lead at the upper end of the vessel, maintaining a dispersion of sulphur in the stream without substantial back-mixing for a time sufficient to effect reaction between the sulphur and the copper, recovering the stream of lead from the lower end of the vessel, and allowing the formed copper sulphide to float to the surface of the molten lead.

4,390,364
REMOVAL OF FINE PARTICLES FROM MOLTEN METAL

Ho Yu, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 3, 1981, Ser. No. 289,749
Int. Cl.³ C22B 21/06, 26/22
U.S. Cl. 75—67 A 46 Claims



1. A method of treating molten metal containing agglomerable suspended particles of material substantially different in density than said metal but buoyantly suspended in said metal because of their fine size comprising:

(a) passing said metal containing said fine particles through a medium of submerged contacting surfaces selected to avoid introduction of unwanted contaminants into said metal, said medium having a high average void fraction and a high specific surface area so as to agglomerate

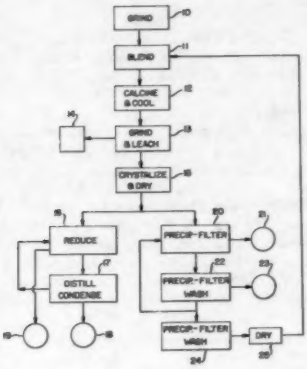
portions of said particles to form agglomerated particles of larger size separable by gravity from said molten metal;
(b) carrying agglomerated particles out of said media by sufficient molten metal velocity; and
(c) moving said molten metal containing agglomerated particles through a gravity separation zone including means to separate said agglomerted particles from said molten metal by gravity.

4,390,365

PROCESS FOR MAKING TITANIUM METAL FROM TITANIUM ORE

Robert A. Hard, Laguna Beach, and Martin A. Prieto, Diamond Bar, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Dec. 15, 1980, Ser. No. 216,058
Int. Cl.[3] C01G 23/047
U.S. Cl. 75—84.4 34 Claims



1. A process for the preparation of titanium metal from an ilmenite ore comprising titanium oxides and from about 14 to about 36%, by weight iron which comprises the steps of:
(a) fluorinating said ore by contacting said ore with an alkali metal fluosilicate at a temperature of from about 600° to about 1000° C. to form a fluorinated ore and thereby convert the titanium oxides to titanium fluorides, and
(b) reducing the titanium fluorides to titanium metal.

4,390,366

PROCESS FOR THE EXTRACTION OF PRECIOUS METALS FROM SOLUTIONS THEREOF

Richard K. Lea, Watford; Julian D. Edwards, Chalfont St. Peter, both of England, and D. Frederick Colton, Burlington, Canada, assignors to Inco Limited, Toronto, Canada

Filed Sep. 1, 1981, Ser. No. 298,355
Claims priority, application United Kingdom, Sep. 5, 1980, 8028662
Int. Cl.[3] C01G 7/00, 55/00
U.S. Cl. 75—101 BE 15 Claims

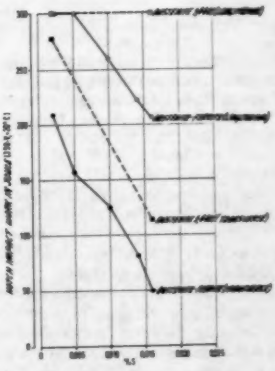
1. A selective solvent extraction process for sequentially and selectively separating and removing gold and platinum group metal values from a chloride containing aqueous solution, the process comprising:
(a) oxidizing ruthenium and osmium to their respective tetraoxides by adding an oxidizing agent to the solution,
(b) adjusting the solution in step (a) above to about 0–2 pH units before the oxidizing agent is added and adding about 7–10 times the stoichiometric amount of the oxidizing agent required to oxidize all of ruthenium and osmium to their tetraoxides,
(c) removing the tetraoxides from the solution,
(d) selectively removing gold from the solution by solvent extraction to a residual content of less than two parts-per-million in order to avoid contamination of metals to be extracted subsequently,
(e) removing the remaining solvent in the solution and reacidifying the solution to a hydrochloric acid concentration of from 3 to 6 M,
(f) selectively removing palladium from the solution by solvent extraction with a dialkyl sulfide,
(g) reducing iridium to the trivalent state until its redox potential is about +500 mV relative to a standard colomel electrode,
(h) selectively removing platinum from the solution by solvent extraction with tributyl phosphate and then removing the solvent from the solution,
(i) reoxidizing the iridium to the tetravalent state and extracting the trivalent state from the solution by solvent extraction with tributyl phosphate, and
(j) extracting the rhodium with a reducing agent.

4,390,367

HIGH-ALLOYED STEEL BEING RESISTIVE TO CORROSION BY NATURAL GAS

Norbert Niehaus, Düsseldorf; Rolf Pöpperling, Mülheim, and Horst Bester, Krefeld, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,337
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3024380
Int. Cl.[3] C22C 38/22, 38/38
U.S. Cl. 75—125 4 Claims



1. Highly alloyed, weldable, passivatible, austenitic-ferritic steel alloy, having a tensile strength and elastic limit, comprising:
Up to 0.05% carbon
20.0 to 25.0% chromium
5.0 to 9.5% nickel
3.0 to 6.0% molybdenum
0.01 to 2.5% copper
0.1 to 1.5% silicon
0.5 to 2.5% manganese
0.05 to 0.3% nitrogen
the remainder being iron for a 50%-to-50% ratio of austenite to ferrite; and a sulphur content not exceeding 0.005% in order to obtain a high toughness transversely to a direction of principle plastic deformation.

4,390,368

FLAME SPRAY POWDER

David L. Houck, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1981, Ser. No. 250,323
Int. Cl.³ B22F 1/00
U.S. Cl. 75—251 3 Claims

1. A free flowing plasma spray powder of substantially spherical particles having substantially smooth surfaces, said powder having a Hall flow within the range of about 4 to about 7 seconds for about 50 grams and being substantially uniform composition consisting essentially of about 4 to about 6 percent by weight rhenium with the balance being tungsten, wherein substantially all of said particles have a size greater than about 10 microns and are melt alloyed by plasma densification to a uniform composition.

4,390,369

NATURAL WAX-CONTAINING INK JET INKS

Alfred R. Merritt; Theodore M. Cooke, both of Danbury; An-Chung R. Lin, New Town, and Richard G. Whitfield, Brookfield, all of Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 17, 1981, Ser. No. 331,604
Int. Cl.³ C09D 11/12
U.S. Cl. 106—31 19 Claims

1. A non-aqueous, phase change ink jet ink composition consisting essentially of at least one natural wax, said wax-containing composition to be discharged in a liquid phase at an elevated temperature above ambient from an ink jet apparatus and which solidifies to a solid phase upon impact with a target.

4,390,370

METAL SILICO-PHOSPHATE BINDERS AND FOUNDRY SHAPES PRODUCED THEREFROM

Charles E. Seeney, Brazil, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jan. 25, 1982, Ser. No. 342,308
Int. Cl.³ B28B 7/34
U.S. Cl. 106—38.3 17 Claims

1. A binder and composition hardener for foundry aggregates comprising, as the binder, a product obtained by reacting phosphoric acid with a mineral silicate selected from the group consisting of zeolites, nepheline syenite and olivine in a ratio of about 3–5:1 by weight at a temperature of about 70°–100° C. for a period of two hours or more and a hardening amount of a hardener selected from the group consisting of a linear alkali metal polyphosphate, a linear ammonium polyphosphate, a polyvalent metal compound selected from the group consisting of alkaline earth metal oxides, silicates and aluminates, potassium olivine phosphate, and aluminum dihydrogen phosphate or mixtures thereof.

9. A process for preparing foundry cores and molds comprising mixing a foundry aggregate with a binder and a hardener therefor wherein the binder comprises the reaction product obtained by heating phosphoric acid and olivine in a weight ratio of about 3–5:1, and the hardener is selected from the group consisting of a linear alkali metal polyphosphate, a linear ammonium polyphosphate, aluminum dihydrogen phosphate, potassium olivine phosphate and a polyvalent metal compound selected from the group consisting of alkaline earth metal oxides, silicates and aluminates packing the mixture into a core or mold box and allowing said mixture to stand for a length of time sufficient to cure the binder and form the core or mold.

4,390,371

METHOD FOR MIXING, SPRAYING AND PLACING CEMENTITIOUS MATERIALS

Charles E. Cornwell, 7104 Marian Dr., Alexandria, Va. 22307

Filed Aug. 4, 1981, Ser. No. 289,986
Int. Cl.³ C04B 15/00
U.S. Cl. 106—88 7 Claims

1. A continuous process for production of cementitious compositions having controlled densities comprising the steps of simultaneously supplying separate flows of fluids and a blend of dry cement and aggregates to a common junction where the flows are intermixed into a common flow upon coming in contact; moving the common flow through static mixers containing a series of angularly disposed baffles causing a turbulence and uniform mixing of the common flow; further comprising adding a flow of preformed foam to the common flow of mixed cementitious compositions and conveying the combined flows to a discharge nozzle; further comprising injecting said fibers into the common flow after exit from the nozzle and just before placement.

4,390,372

DRY PRE-MIXED MORTAR

George E. Hardin, 3032 Market Pl., Bloomington, Ind. 47401

Filed Sep. 23, 1980, Ser. No. 189,748
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 2 Claims

1. A dry mix multi-purpose mortar composition comprising: 40% to 60% by weight Portland cement, 25% to 85% by weight finely divided stone, 5 to 60 grams of a surfactant per 100 pounds of dry mix, said finely divided stone having a particle size of between 50 mesh and 200 mesh and selected from the group consisting of marble flour, granite flour, stone flour and fine sand and at least about one-half gallon of a vinyl acrylic latex copolymer having solids content of about 65% by weight, said surfactant being an alkyl aryl sulfonate which is added in amounts of about 5 to 60 grams per 100 pounds of dry mix.

4,390,373

TRANSPARENT ABRASION RESISTANT FILLED ORGANO-POLYSILOXANE COATINGS CONTAINING COLLOIDAL ANTIMONY OXIDE AND COLLOIDAL SILICA

William H. White, La Puente; William C. Harbison, and Gary L. Nelson, both of Lake Forest, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Filed Oct. 7, 1981, Ser. No. 309,423
Int. Cl.³ C09K 3/14; B32B 9/04
U.S. Cl. 106—287.12 14 Claims

1. A coating composition which forms a transparent, abrasion resistant coating upon curing, said coating composition comprising an effective abrasion resisting amount of a colloidal dispersion containing colloidal silica and an effective abrasion resistance enhancing amount of colloidal antimony oxide in a weight ratio of less than or equal to about 30:70, antimony oxide:silica, in a water-alcohol solution of the partial condensate of $RSi(OH)_3$ wherein R is an organic radical.

4,390,374

RUTILE (TiO_2) PIGMENTS COATED WITH (1) TRIGONAL ANHYDROUS ALUMINA (AL_2O_3) AND (2) CUBIC METAL ALUMINATE ($MEAL_2O_4$) (Me = Co, Ni, Cu, Zn, Mg) AND PROCESS

Luigi Balducci, Mortara, and Massimo Rustioni, Calusco D'Adda, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 26, 1981, Ser. No. 266,648
Claims priority, application Italy, May 28, 1980, 22355 A/80
Int. Cl.³ C09C 1/36, 3/06
U.S. Cl. 106—300 7 Claims

1. Inorganic pigments based on TiO_2 and metallic alumi-

nates, characterized in that their particles consist of a TiO_2 rutile nucleus, a first adherent coating of trigonal Al_2O_3, and a second adherent coating of cubic $MeAl_2O_4$, in which Me is selected from the class consisting of Co, Ni, Cu, Zn and Mg.

2. A process for preparing a pigment according to claim 1, characterized in that TiO_2 rutile particles coated with an adherent coating of Al_2O_3 are mixed with an oxide MeO or a Me compound capable of providing MeO in a subsequent calcining step, and the mixture is calcined in the presence of air at temperatures ranging from 750° to 1000° C.

4,390,375

PROCESS AND CONTINUOUS APPARATUS FOR CHEMICAL CONVERSION OF MATERIALS

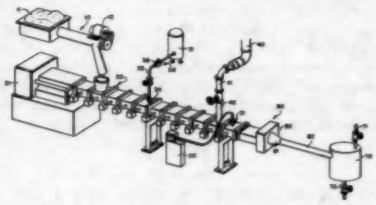
Barry Rugg, New York, N.Y., and Robert Stanton, Ramsey, N.J., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 244,244, May 18, 1981, Pat. No. 4,363,671, which is a division of Ser. No. 131,339, Mar. 18, 1980, Pat. No. 4,316,748. This application Apr. 17, 1981, Ser. No. 255,189

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ C13K *1/02*; B01J *3/03*

U.S. Cl. 127—37 **7 Claims**



1. In a process for the acid hydrolysis of waste cellulose to glucose of the type wherein waste cellulose is continuously fed into inlet port of a twin screw extruder; steam or superheated water is continuously fed into a reaction zone in the extruder, downstream of the inlet port; the cellulose is continuously reacted with water in the presence of an acid catalyst at an elevated temperature and pressure in the reaction zone while being continuously conveyed to an outlet port of the extruder having a given diameter, and the reacted cellulose is discharged from the extruder while the elevated temperature and pressure in the reaction zone is maintained, the improvement comprising maintaining an elevated pressure of 100–1000 p.s.i.g. by forming a dynamic seal zone at the upstream end of the reaction and continuously discharging the reacted material downstream of the outlet port at a volume rate of flow controlled solely by the continuous restriction of flow generated by passing the discharge through an orifice pipe having a length greater than 5 times that of the radius of said orifice pipe and having a smaller diameter than the given diameter of the outlet port, thereby to maintain the elevated temperature in the reaction zone.

4,390,376

TINE ASSEMBLY AND METHOD FOR REMOVAL OF DEBRIS FROM DOWN COTTON CLUMPS

William E. Rood, Jr., 3134 E. Fargo Cir., Mesa, Ariz. 85203

Filed Jan. 11, 1982, Ser. No. 338,219

Int. Cl.³ A01D *46/08*

U.S. Cl. 134—6 **22 Claims**

1. An apparatus for removing dirt and debris from clumps of cotton that are released from slots of a group of retrieving belts as the belts pass around a rotating pulley means that causes the slots to open, said apparatus comprising in combination:

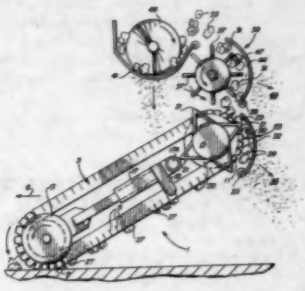
(a) first means for catching the released clumps in a lower portion of a curved region that is bounded by the portions of the belts passing around said pulley means and a first group of curved, spaced tines disposed adjacent to said portions of said belts;

(b) second means for

(i) forcing the clumps to move along said tines of said first group from the lower portion of said first region to an upper portion thereof, said forcing loosening dirt and/or debris from the clumps, the loosened dirt and/or debris falling between said tines of said first group; and

(ii) ejecting the clumps from said upper portion of said first region.

16. A method for removing dirt and debris from clumps of cotton that are released from slots of a group of retrieving belts



as the belts pass around a rotating pulley means that causes the slots to open, said method comprising the steps of:

(a) catching the released clumps in a lower portion of a first region that is bounded by the portions of the belts passing around the pulley means and a first group of curved, spaced tines disposed adjacent to said portions of the belts;

(b) forcing the clumps to move along the tines of the first group from the lower portion of the first region to an upper portion thereof, said forcing loosening dirt and/or debris from the clumps, said loosened dirt and/or debris falling between the tines of said first group; and

(c) ejecting the clumps from the upper portion of the first region.

4,390,377

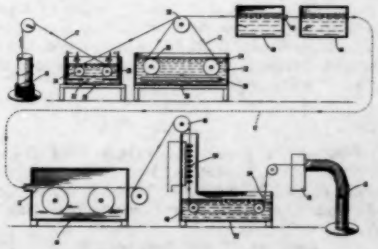
NOVEL CONTINUOUS, HIGH SPEED METHOD OF GALVANIZING AND ANNEALING A CONTINUOUSLY TRAVELLING LOW CARBON FERROUS WIRE

James W. Hogg, 6216 Hillsboro Rd., Nashville, Tenn. 37215

Filed Jan. 12, 1981, Ser. No. 224,482

Int. Cl.³ C21D *8/06*

U.S. Cl. 148—12 B **13 Claims**



1. A continuous, high speed, method of galvanizing and annealing a continuously travelling low carbon ferrous wire to provide a highly corrosion resistant, more ductile wire having a bright silvery luster comprising:

(a) passing said continuously travelling ferrous wire after it has been cleaned through a zinc electroplating bath to deposit a zinc coating on said wire,

(b) passing the zinc coated wire through a bath of molten aluminum-zinc eutectic alloy maintained at a temperature of about 734° F. to about 786° F. comprising a major portion of zinc and sufficient aluminum to provide an aluminum-zinc alloy having a melting point below that of zinc and in the range of about 734° F. to about 786° F. to provide a coating containing zinc and aluminum on the wire,

(c) drawing the coated continuously travelling ferrous wire down to a lesser cross-sectional area,

(d) continuously annealing the drawn, continuously travelling, coated ferrous wire at a temperature above the melting point of the Zn-Al-Zn coating to about 1400° F. for a short period of time sufficient to relieve the stresses imparted to the wire by the drawing step but not so long that inhibiting action of the aluminum content in the coating on the iron-zinc alloying action and oxidation is completely overcome, and

(e) thereafter quenching the annealed wire.

4,390,378

METHOD FOR PRODUCING MEDIUM SILICON STEEL ELECTRICAL LAMINATION STRIP

Prabhat K. Rastogi, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Jul. 2, 1981, Ser. No. 279,829

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—111 **11 Claims**

1. In a method for producing cold rolled steel strip for use in electric motor core laminations, the steps of:

providing a steel consisting essentially of the following composition in wt.% before cold rolling:

carbon: 0.05 max.

manganese: 0.50–0.70

silicon: 0.85–1.05

aluminum: 0.20–0.30

phosphorus: 0.08 max.

sulfur: 0.02 max.

iron: essentially the balance;

hot rolling said steel into steel strip;

coiling said hot rolled steel strip while the steel is at a coiling temperature in the range 1250°–1400° F. (682°–760° C.) and then allowing said coiled strip to cool;

cold rolling said steel strip;

continuously annealing said steel strip at a strip temperature in the range 1250°–1400° F. (682°–760° C.) for about 2–5 minutes, and then allowing said strip to cool;

and temper rolling said strip to produce a reduction of about 6–8.5%;

whereby said steel strip, after said temper rolling step, has a grain size and crystallographic orientation which, upon subsequent magnetic annealing at a temperature in the range 1400°–1550° F. (760°–843° C.) for about 1–2 hours in a decarburizing atmosphere, produces an average ferritic grain size of about 4.0–5.0 ASTM and a preponderance of crystallographic planes containing the easiest direction of magnetization.

4,390,379

ELIMINATION OF EDGE GROWTH IN LIQUID PHASE EPITAXY

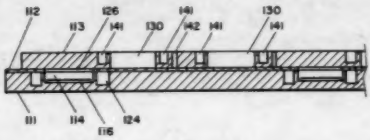
Suei-Yuen P. Lien, West Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,412

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **3 Claims**

1. A method of growing a semiconductor layer by liquid phase epitaxy utilizing a slide type apparatus comprising a substrate carrier having a recess for holding a substrate and a source material carrier slidably arranged over the surface of the substrate carrier and including a well around the recess, including the steps of filling said well with material selected from a thermally insulating material and a material which is



molten at the temperature of crystal growth and then cycling the temperature of the apparatus in a manner so as to form an epitaxial layer on a substrate in the recess which layer is essentially free of excess edge growth.

4,390,380

COATED AZIDE GAS GENERATING COMPOSITION

Albert T. Camp, Rte. 1, Box 1278, Welcome, Md. 20693

Continuation-in-part of Ser. No. 135,634, Mar. 31, 1980, Pat. No. 4,339,288, which is a continuation of Ser. No. 906,596, May 16, 1978, abandoned. This application Apr. 21, 1982, Ser. No. 370,586

Int. Cl.³ C06B *45/34*

U.S. Cl. 149—8 **5 Claims**

1. A gas generating composition for use in inflating automobile crash bags comprising a mixture, in pellet form, of an alkali metal azide and an oxidant, each pellet coated with a lacquer comprising pentaerythritol trinitrate acrylate polymer.

4,390,381

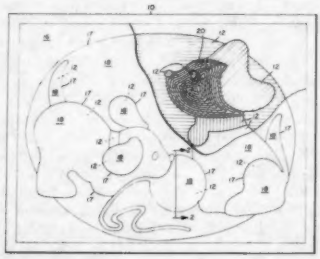
YARN COLORING PICTURE SET AND METHOD OF COLORING

Gary R. Lemmeyer, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 228,871, Jan. 27, 1981, Pat. No. 4,355,722. This application May 10, 1982, Ser. No. 376,669

Int. Cl.³ B32B *31/00*; A01C *1/00*; B65D *69/00*

U.S. Cl. 156—63 **3 Claims**



1. A method for coloring a picture with colored yarn comprising the steps of:

providing a board having an adhesive layer covered by a cover sheet;

die-cutting the outlines of picture segments through said cover sheet to form adjacent die-cut cover sheet sections;

selectively removing said cover sheet sections to expose different colored parts of the adhesive layer therebelow; and

pressing different colored yarns to said exposed parts of said adhesive layer, said yarn adhering to said adhesive layer to form a yarn colored picture wherein the step of pressing colored yarns is achieved by a manually operated yarn pencil having a housing, a spool rotatably mounted within

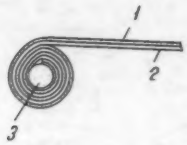
said housing upon which yarn is wound, and an opening at one end of said pencil through which an end of the yarn is fed and pressed onto said exposed parts of said adhesive layer.

4,390,382

TONE ARM MANUFACTURING METHOD

Shunsuke Matsuda, Osaka, and Yasumasa Komatsu, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 8, 1981, Ser. No. 281,509
Claims priority, application Japan, Jul. 8, 1980, 55-93649
Int. Cl.³ B65H *81/00*; G01B *3/10*
U.S. Cl. 156—184 **4 Claims**



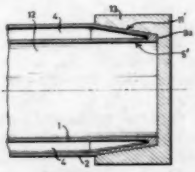
1. A method of manufacturing a tone arm, comprising:
preparing a carbon fiber prepreg;
preparing a sheet containing graphite flake particles bound with resin in such a manner that said flake particles are layered face to face, said resin being heat-hardenable under conditions similar to those for said carbon fiber prepreg;
placing said carbon fiber prepreg on said sheet to form a double layer;
winding said double layer on a core so as to form a cylindrical layered assembly on said core;
heat-hardening said cylindrical layered assembly; and
removing said core from said assembly, thereby forming a pipe-shaped tone arm.

4,390,383

METHOD OF MAKING PLASTIC PIPES HAVING WALLS WITH LENGTHWISE EXTENDING CHANNELS

Jan P. van Dongeren, Bergentheim, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 904,218, May 9, 1978, Pat. No. 4,280,534, and a continuation of Ser. No. 728,117, Sep. 30, 1976, abandoned. This application Mar. 25, 1981, Ser. No. 247,364
Claims priority, application Netherlands, Oct. 3, 1975, 7511693
Int. Cl.³ B29C *11/00*; F16L *9/18*
U.S. Cl. 156—196 **9 Claims**



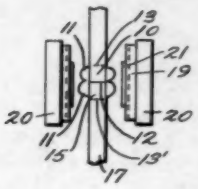
1. A method of manufacturing a pipe formed of a plastic material, said pipe comprising an inner wall and an outer wall which are interconnected by a plurality of connecting partitions extending lengthwise of said pipe, said plurality of connecting partitions forming a plurality of lengthwise extending channels, comprising the steps of:
heating one end of the pipe to a temperature above the plasticizing temperature of the plastic material; and
pressing one of said inner and outer walls against the other at said heated one end of the pipe to sealingly fuse the inner and outer walls together and thereby form a beveled edge on said one end of the pipe.

4,390,384

METHOD AND APPARATUS FOR BONDING THERMOPLASTIC MATERIALS

E. Wayne Turner, Deerfield, Mass., assignor to Hardigg Industries, Inc., South Deerfield, Mass.

Continuation of Ser. No. 63,926, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 862,559, Dec. 20, 1977, abandoned. This application Nov. 18, 1980, Ser. No. 322,580
Int. Cl.³ B29C *19/00*
U.S. Cl. 156—221 **15 Claims**



1. A method of bonding two pieces of thermoplastic material to one another to form an article, consisting essentially of the steps of:
heating at least one edge of each of said two pieces to at least about the fusion temperature of said thermoplastic material;
then butt joining said heated edges to one another under pressure to thereby form a welded junction, said pressure causing a bead of plastic material to be formed on at least one side of said welded junction; and
improving the physical and dielectric strength of the material of said welded junction by subjecting the welded junction to a reheat treatment to cause the material to become molten, and quenching the molten material to reduce its temperature to a temperature at least below said fusion temperature.

4,390,385

HEAT SEALABLE, MULTI-PLY POLYPROPYLENE FILM

Daniel J. Ferguson, Spartanburg; Frederick D. Stringer, Greenville, and Michael D. Esakov, Greer, all of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Division of Ser. No. 152,970, May 23, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,161
Int. Cl.³ B32B *31/16*
U.S. Cl. 156—229 **4 Claims**

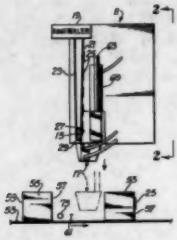
1. A method of increasing the sealing temperature range of propylene homopolymer film comprising the steps of:
(a) providing a base layer comprising propylene homopolymer;
(b) laminating a skin layer to at least one side of said propylene homopolymer film, said skin layer comprising a blend of 60% to 80% by weight of propylene-ethylene copolymer having 2% to 6% by weight of ethylene with 40% to 20% by weight of propylene homopolymer the ratio of the thickness of the base layer to the thickness of the skin layer being at least 4:1; and,
(c) biaxially stretching said laminated film to a final total film thickness in the range from 0.25 mil to 2.5 mil, said film having a sealing range of at least 20° C. thereby producing a heat sealable, heat shrinkable propylene homopolymer film.

4,390,386

LABEL APPLICATOR AND METHOD FOR LABELING THE FORWARD FACES OF ARTICLES

James C. Bartl, LaHabra, Calif., assignor to Label-Aire Inc., Fullerton, Calif.

Filed May 26, 1981, Ser. No. 267,252
Int. Cl.³ B65C 9/18, 9/28
U.S. Cl. 156—235 10 Claims



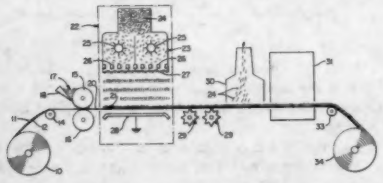
1. A method of labeling comprising:
moving a plurality of articles in a row through a labeling station with each of the articles having at least one transverse face facing transversely to the direction of movement of the articles;
dispensing a label onto a labeling head with the labeling head being outside of the path of movement of the articles;
releasably retaining the label on the labeling head;
advancing the labeling head into the path of movement of the articles at the labeling station;
transferring the label from the labeling head to the transverse face of the article at the labeling station while the labeling head is in the path of movement of the articles at the labeling station; and
retracting the labeling head from the path of movement of the articles at the labeling station.

4,390,387

FLOCKED MATERIAL HAVING FIRST THERMOSETTING ADHESIVE LAYER AND SECOND THERMOPLASTIC ADHESIVE LAYER

John E. Mahn, 6154 Oakhaven, Cincinnati, Ohio 45238

Filed Jun. 16, 1981, Ser. No. 274,146
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ B32B 33/00
U.S. Cl. 428—90 11 Claims



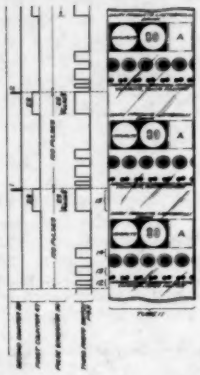
1. A combination comprising a flocked laminate of two layers including a first layer of amorphous thermoset adhesive having flock fibers permanently adhering to one surface thereof and the opposing surface of said first layer being bonded to a second layer containing an amorphous thermoplastic adhesive selected from the group consisting of a mixture of polyester and polyurethane and a mixture of polyamide and polyurethane wherein said second layer has a thickness greater than the thickness of said first layer, and said second layer becoming adhesive upon heating, said laminate being non-curling.

4,390,388

AUTOMATIC SPLICER IN TAPE FEEDER OR THE LIKE

Takao Nagata, Fujisawa, and Yoshiyuki Rokutanbo, Yokohama, both of Japan, assignors to Nippon Jidoh Seiki Kabushiki Kaisha, Yokohama, Japan

Filed May 26, 1981, Ser. No. 267,409
Claims priority, application Japan, Mar. 25, 1981, 56-043357
Int. Cl.³ B65H 19/18, 69/06
U.S. Cl. 156—351 7 Claims



1. A tape splicer in an automatic continuous tape feeder for splicing tapes including tubular tapes, each of said tapes having patterns repeatedly printed thereon in a predetermined constant pitch and containing, in said pattern a gap of a constant length within each pitch; comprising:
a pair of paths capable of alternately feeding rolls of tapes in appropriate quantities from a pair of reels supporting thereon said rolls of tapes to a common feed roller;
first and second photoelectric conversion switches for detecting the passage of the trailing end portion of each of said tapes, each of said switches disposed in each of said paths in positions upstream of and equidistant from said feed roller;
a pair of tape holding plates disposed outside said pair of paths between said photoelectric conversion switches and said feed roller, respectively, with such a gap between them that the front surfaces thereof are opposed to each other and are capable of joining each other when they undergo displacement towards each other;
each of said tape holding plates having vacuum suction holes bored on the front surface thereof for drawing and holding said tapes thereon in a waiting state at predetermined positions in the direction of width and with predetermined positions in the longitudinal direction in order to splice the leading end portion of the succeeding tape pulled out from one of said reels to the trailing end portion of the preceding tape pulled from the other of said reels;
a third photoelectric conversion switch for detecting said patterns of said tapes, disposed between said tape holding plates and said feed roller;
a rocking roller disposed downstream of said feed roller, suspended by said tapes stretched between two guide rollers, having both axial end portions thereof disposed movably in vertical direction along guide frames and capable of rising against gravity to feed stored tape in the downstream direction when said feed roller stops rotating and tension is applied to said tape;
a driving motor for said feed roller capable of being changed over to low speed revolution upon receiving a signal

generated when the trailing end portion of the preceding tape pulled out from one of said reels and fed through the one of said paths passes by said first or second photoelectric conversion switch, and returned to high speed revolution upon receiving a signal generated when said tape holding plates withdraw after the completion of tape splicing;

a pulse generator actuated upon receiving said signal generated from said first or second photoelectric conversion switch and generating pulses in such a number as to be proportional to a rotational displacement of said feed roller;

a first counter so set as to receive the number of pulses generated from said pulse generator and an ON-OFF signal detected from said third photoelectric conversion switch, and to generate one signal whenever the pulse number corresponding to the gap of said pattern is counted;

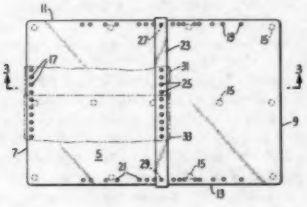
a second counter set so as to receive the signal generated from said first counter and to generate a signal instructing the stop of said feed roller and a signal to instruct the advance and joining of said pair of tape holding plates when a number of pulses equal to the number of pitches corresponding to the distance between the set position of said first or second photoelectric conversion switch and the set position of said pair of tape holding plates are counted.

4,390,389

DATA SPLICE KIT

Norman L. Bunas, and Gertrude I. Smith, both of Palo Alto, Calif., assignors to Devoke Company, Santa Clara, Calif.

Filed Jan. 11, 1982, Ser. No. 338,624
Int. Cl.³ B31F 5/06
U.S. Cl. 156—502 **1 Claim**



1. An adjustable splicing jig for continuous paper forms having evenly spaced perforations along each marginal edge wherein said forms may vary in width comprising in combination:

(a) a generally rectangular flat base having a plurality of upstanding pins aligned along one marginal edge of said base, the spacing of said pins being equal to the spacing of at least some of said perforations,

(b) a plurality of complementary spaced holes at both the top and bottom edges of said base,

(c) a movable member having a plurality of upstanding pins corresponding to the pins on the marginal edge of said base and having a downwardly directed pin at each end thereof to engage opposed holes at the top and bottom edges of the base whereby the upstanding pins of said movable member are maintained parallel to the upstanding pins on said base,

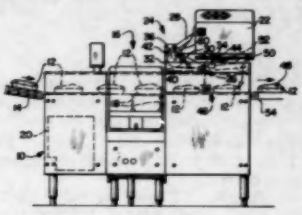
(d) whereby said movable member can be moved across said base and held by said downwardly directed pins in selected opposed holes to accommodate forms of various widths.

4,390,390

LABEL APPLICATOR DEVICE

Dallas A. Margraf, Spring Valley, and Fritz F. Treiber, Centerville, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 30, 1981, Ser. No. 258,964
Int. Cl.³ B65C 9/00; B32B 1/00; B65B 61/00
U.S. Cl. 156—566 **10 Claims**



1. A label applicator device for applying a label to the surface of a substantially rectangular package in a selected orientation, comprising:

package conveyor means for presenting a package at an applicator station,

control means for selecting first or second label orientations,

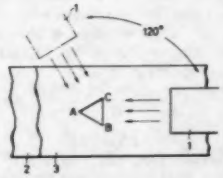
applicator means, responsive to said control means, for receiving a label at a label output station and for applying said label to the surface of said package, said label being applied in a first orientation with respect to said package or in a second orientation with respect to said package, said second orientation being rotated approximately 90° with respect to said first orientation.

4,390,391

METHOD OF EXPOSURE OF CHEMICALLY MACHINABLE LIGHT-SENSITIVE GLASS

Yoshimi Fujita, Akishima, and Toshiharu Yamashita, Hachioji, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 384,114
Claims priority, application Japan, Jun. 26, 1981, 56/98267
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—628 **4 Claims**



1. A method for irradiating a chemically machinable light-sensitive glass plate with a parallel bundle of ultraviolet rays, comprising the steps of:

mounting a mask having a regular polygonal opening therein on a surface of said plate, said polygonal opening having n vertexes;

mounting a light source capable of generating said parallel bundle of ultraviolet rays above said mask so that said rays enter said glass at a predetermined oblique angle of incidence;

positioning said light source so that one of said n vertexes of said polygonal opening is at a longest point from a central point of said light source;

irradiating said plate with said parallel bundle of ultraviolet rays;

repositioning said glass plate, said mask and said light source by rotating either said mask, said plate, or said light source about a center axis of said polygonal opening by an angle equal to 360°/n;

re-irradiating said plate with said parallel bundle of ultraviolet rays; and

repeating said repositioning and reirradiating steps so that said glass plate is irradiated n times.

4,390,392

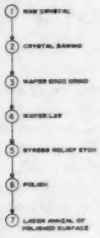
METHOD FOR REMOVAL OF MINUTE PHYSICAL DAMAGE TO SILICON WAFERS BY EMPLOYING LASER ANNEALING

John T. Robinson, Sherman; Olin B. Cecil, and Rajiv R. Shah, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1980, Ser. No. 187,662

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **2 Claims**



2. A process for fabrication of semiconductor wafers suitable for use in the manufacture of integrated circuits, comprising:

(a) sawing silicon crystals into thin wafers;

(b) edge grinding to remove roughness around the circumference of each said wafer;

(c) wafer lap to remove prominent damage and smooth out wafer surface;

(d) stress relief etch to remove small stress cracks from the surface of said wafer; and

(e) polish for final smoothing and damage removal from said surface of said wafer;

(f) subjecting the surface of said wafer to said laser beam to cause melting and recrystallization of said surface while said wafer is in a partial vacuum for removal of minute abrasive damage to said surface of said wafer, and for denuding surface layer of said wafer of a significant portion of the oxygen contained therein.

4,390,393

METHOD OF FORMING AN ISOLATION TRENCH IN A SEMICONDUCTOR SUBSTRATE

Mario Ghezzo, Ballston Lake, and Bruce F. Griffing, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,379

Int. Cl.³ H01L *21/308*

U.S. Cl. 156—643 **6 Claims**

1. A method of forming in a substrate of silicon semiconductor material having a major surface an active region adjacent said major surface surrounded by a trench in said substrate filled with silicon dioxide, said trench being surrounded by a thick layer of silicon dioxide on said major surface independent of the dimensions of said trench comprising:

providing said substrate having said major surface,

forming a thin layer of silicon dioxide on said major surface,

forming a protective layer on said layer of silicon dioxide,

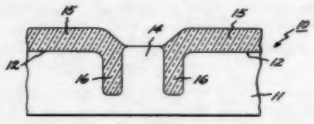
forming a first film of an ion erosion-resistant material on said protective layer,

forming on said first film a layer of an etch-resistant material having a removed portion and a retained portion,

etching said first film and said protective layer through said removed portion of said etch-resistant layer to form an opening in said first film and said protective layer extending to and exposing said thin layer of silicon dioxide, said opening partially surrounding said retained portion of said etch-resistant layer and partially underlying said retained portion of said etch-resistant layer by a predetermined lateral distance,

depositing a second film of an ion erosion-resistant material on the retained portion of said etch-resistant layer and the exposed portion of said thin layer of silicon dioxide,

removing the retained portion of said etch-resistant layer with the portion of said second film thereon whereby an edge of the retained portion of said first film is laterally spaced from an adjacent edge of the retained portion of said second film deposited on said thin layer of silicon dioxide on said substrate by approximately said predetermined lateral distance,



etching said substrate and said thin layer of silicon dioxide not covered with retained portions of said first and second films to form a trench in said substrate having one side extending from said edge of the retained portion of said first film and having the opposite side thereof extending from said adjacent edge of the retained portion of said second film, the depth of said trench being substantially greater than the width thereof,

removing said first and second films overlying said major surface of said substrate whereby the exposed portions of said thin layer of silicon dioxide is re-exposed,

heating said substrate in an oxidizing atmosphere to cause silicon dioxide to be grown on the walls of said trench to fill said trench with silicon dioxide and to cause silicon dioxide to be grown on the substrate underlying the exposed portion of said thin layer of silicon dioxide to form a thick layer of silicon dioxide thereon,

removing the retained portion of said protective layer overlying said active region to expose said active region of said substrate.

4,390,394

METHOD OF STRUCTURING WITH METAL OXIDE MASKS BY REACTIVE ION-BEAM ETCHING

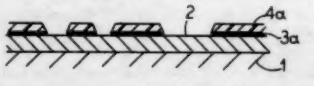
Josef Mathuni, and Karin Unger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,605

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102647

Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **5 Claims**



1. In a method of producing very fine structures in microelectronics with very thin photosensitive resists or resists

which are electron- or x-ray-sensitive as masking, the improvement comprising:

first applying a thin metal oxide layer over a layer to be etched and structuring such oxide layer with a resist by reactive ion-beam etching so as to attain a metal oxide mask; and

dry-etching with an ion-beam the layer to be etched through said metal oxide mask.

4,390,395

PROCESS FOR THE REGENERATION OF WASTE PAPER

Jean De Ceuster, Vilvoorde, and Georges Papageorges, Rixensart, both of Belgium, assignors to Interox, Brussels, Belgium

Continuation of Ser. No. 841,994, Oct. 13, 1977, abandoned.
This application Jun. 23, 1981, Ser. No. 276,467
Claims priority, application Luxembourg, Oct. 15, 1976, 76021
Int. Cl.³ D21C 5/02
U.S. Cl. 162—5 33 Claims

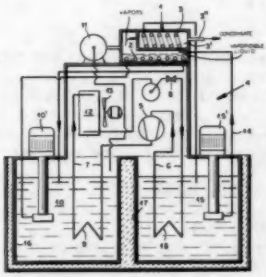
1. In a process for the regeneration of waste paper which comprises the disintegration of the waste paper in a disintegrator directly fed from dry waste paper and functioning with a pulp consistency, at the disintegrator outlet, of between 22 and 45%, in the presence of an aqueous phase, the improvement wherein at least one peroxidic bleaching agent in an amount between 0.1 and 5% by weight of the weight of the dry waste paper is introduced into the disintegrator at the same time.

4,390,396

APPARATUS FOR THE DISTILLATION OF VAPORIZABLE LIQUIDS

Heinz Koblenzer, Filderstadt, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,599
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015525
Int. Cl.³ B01D 3/02
U.S. Cl. 202—166 3 Claims



1. A distillation apparatus comprising:

a distillation chamber adapted to receive a vaporizable liquid to be distilled;

a heater in said chamber for heating said liquid to vaporize same;

a steam-generating hot-water storage tank and a cold-water storage tank;

means for circulating hot water from said hot-water storage tank through said heater to heat said liquid and produce vapor in said chamber;

a condenser connected to said chamber for receiving said vapor and condensing same;

means for circulating cold water from said cold-water storage tank through said condenser for cooling same;

a heat pump forming a closed-loop circulating path for a refrigerant having a full heat-pump circuit including a compressor, a hot branch leading from said compressor, a cold branch leading to said compressor, and a pressure reduction means between said hot and cold branches, said hot branch including a first heat exchanger forming a condenser for said refrigerant and immersed in said hot-water storage tank for heating the water therein, said cold branch including a second heat exchanger immersed in said cold-water storage tank for cooling the water therein; and

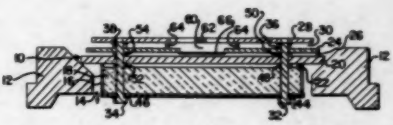
a blower for drawing steam from said hot-water storage tank and blowing said steam into said chamber.

4,390,397

HEAT DISSIPATING CHARGING HOLE COVER

Stanley T. Sczerba, McKeesport, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1981, Ser. No. 334,656
Int. Cl.³ C10B 25/20, 25/24
U.S. Cl. 202—243 6 Claims



1. A coke oven charging hole cover comprising:

(a) a lower concave housing member adapted to be received within the charging hole;

(b) an insulation layer retained within said concave housing member;

(c) a first circular plate superimposed over said concave housing member so that an insulating lower air space is formed between said first circular plate and the insulation layer;

(d) a second plate superimposed over said first circular plate in parallel, spaced relation such that a first heat dissipating air space, said space being open to ambient air, is formed between said first and second plates;

(e) a third plate superimposed over said second plate in parallel, spaced relation such that a second heat dissipating air space, said space being open to ambient air, is formed between said second and third plates; and

(f) heat conducting means connecting the first circular plate with the second plate and the second plate with the third plate, such that heat is continuously removed from the first circular plate to the first and second heat dissipating air spaces.

4,390,398

MODIFIED PROCESS FOR RESIN MANUFACTURING USING A CONTINUOUS SEPARATE DISTILLATION COLUMN

Robert J. Coker, Petrolia; Gary W. Bate, Sarnia, and Henk J. Deuzeman, Warwick Township, Ontario, all of Canada, assignors to Fiberglas Canada Limited, Toronto, Canada

Division of Ser. No. 870,519, Jan. 18, 1978, Pat. No. 4,233,267.
This application May 12, 1980, Ser. No. 148,833
Claims priority, application Canada, Jan. 18, 1977, 269956
Int. Cl.³ B01D 3/14; C08G 63/02
U.S. Cl. 203—18 10 Claims

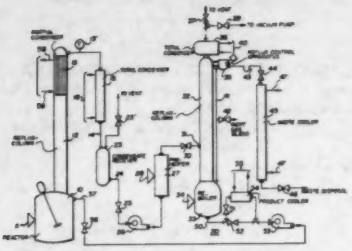
1. A method of continuously separating volatile reactants from volatile by-products of a batch reaction occurring in a batch reaction zone, said reaction producing a vapor effluent that is refluxed and then condensed to produce a condensate output at variable rates and of variable reactant/by-product mix, said method comprising the steps of:

receiving the condensed output from said batch reaction zone and temporarily storing same;

heating and continuously vaporizing a predetermined amount of said stored condensate; and

feeding the vaporized condensate to distillation column means having a reboiler disposed at a low end thereof and a vapor effluent outlet at an opposite high end thereof thereby enabling the further step of:

adjusting temperature and pressure conditions in said distillation column means as a function of said variable reactant/by-product mix for continuously distilling the vapor-



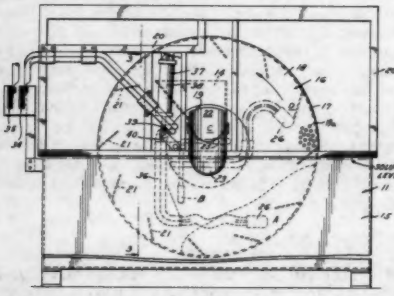
ized condensate fed into said distillation column means and separating the volatile by-products from the volatile reactants at the vapor effluent outlet of said distillation column means independently of the temperature and pressure conditions in said batch reaction zone and independently of the rate of production of said condensate from said batch reaction zone.

4,390,399

METHOD AND APPARATUS FOR PLATING ARTICLES

Robert McInnes, 1108 Fairway Dr., Linden, Mich. 48451

Filed Nov. 24, 1980, Ser. No. 209,867
Int. Cl.³ C25D *17/20*
U.S. Cl. 204—32 R **13 Claims**



1. In an apparatus for cleaning and plating articles, the combination comprising a plurality of tank assemblies comprising a plurality of containers adapted to contain liquid treating material, a barrel adapted to be at least partially submerged in liquid in each said container, each said barrel having a longitudinal axis, means for supporting each said barrel rotatably about a fixed generally horizontal axis so that a portion of the barrel is submerged in liquid in said container when liquid is in the container, each said barrel having end walls, each end wall having an opening therethrough along the longitudinal axis of the barrel, each said barrel having a plurality of circumferentially spaced baffles on the inner periphery thereof extending axially between the end walls, said baffles extending generally radially inwardly and forming an acute angle with the inner periphery of the barrel and spaced from said openings such that when the barrel is rotated in one direction, said baffles agitate the articles, and when said barrel is rotated in the opposite direction, said baffles elevate the articles and the cause them to drop, and chute means extending at an angle from the interior of one said barrel adjacent one end wall through the other end wall to the interior of the succeeding barrel such as to guide articles dropped by the baffles by gravity to the succeeding barrel, the improvement comprising

at least one anode,

at least one cathode,

means for mounting said anodes and cathodes within a barrel for movement between a first position where said anodes and cathodes are in the liquid when the barrel is rotated in one direction to agitate and plate the articles and a second position when said anodes and cathodes are out of contact with the parts and liquid when the barrel is rotated to transfer the articles, and

means for moving said anodes and cathodes between said first and second positions.

4,390,400

ALUMINUM CHLORIDE ADDITION TO ELECTROLYTIC CELLS

Wendell E. Dunn, Jr., Spearfish Canyon, S. Dak., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 26, 1981, Ser. No. 266,951
Int. Cl.³ C25C *3/06, 3/18*
U.S. Cl. 204—67 **3 Claims**

1. A method for transferring aluminum chloride values from a condensation zone to an electrolytic cell for the reduction of aluminum chloride comprising the steps of:

(a) condensing gaseous aluminum chloride dimer in contact with solid depleted reduction cell melt comprising an alkali chloride to form a liquid aluminum chloride/alkali chloride complex; and

(b) transferring the liquid aluminum chloride/alkali chloride complex to the electrolytic reduction cell.

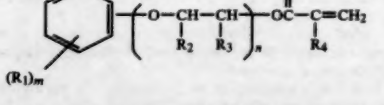
4,390,401

ACRYLATE OR METHACRYLATE ESTERS OF ALKYLENE OXIDE ADDUCTS OF ALKYL/ARYL PHENOLS AS WETTING AGENTS FOR ULTRAVIOLET CURABLE COATING COMPOSITIONS

John R. Costanza, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y. and Celanese Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,217
Int. Cl.³ C08F *2/50, 216/16*
U.S. Cl. 204—159.24 **5 Claims**

1. An improved ultraviolet curable coating composition containing a mixture of ultraviolet photoinitiator and polyunsaturated polyacrylates or methacrylates, and containing as an additional component between about 5 and 50 weight percent, based on the total ultraviolet composition, of a composition having the formula



wherein R_1 is an alkyl group of 1–20 carbon atoms or an alkyl-/aryl group of 6–28 carbon atoms; m is a whole number integer of 1–3; R_2 and R_3 are alkyl or aryl groups or hydrogen; n is a whole number integer of from 1–36; and R_4 is hydrogen or methyl.

4,390,402

PROCESS FOR REGENERATING SPENT SEED MATERIALS USED IN MAGNETOHYDRODYNAMIC POWER GENERATION

Krishnamurthy N. Mani, Denville, and Frederick P. Chlanda, Rockaway, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Jan. 7, 1982, Ser. No. 337,801
Int. Cl.³ B01D 57/02
U.S. Cl. 204—180 P 18 Claims

1. A process for converting alkali metal sulfate compounds into the corresponding metal carbonate which comprises the steps of:

(a) introducing an aqueous solution comprising an alkali metal sulfate into the acid zone of an electrodialysis cell including one or more acid and base zone pairs, arranged in alternating fashion between an anode and a cathode, said acid zone of each of said pairs being located between a cation face of a bipolar membrane and a face of a cation permselective membrane, and said base zone of each of said pairs being located between an anion face of said bipolar membrane and a face of a cation permselective membrane;

(b) introducing an aqueous solution comprising carbon dioxide, an alkali metal carbonate, alkali metal bicarbonate or a mixture thereof into said base zone; and

(c) passing direct current through said electrodialysis cell thereby producing an aqueous solution comprising an alkali metal carbonate in said base zone, and an aqueous solution comprising an alkali metal bisulfate or sulfuric acid in said acid zone.

4,390,403

METHOD AND APPARATUS FOR DIELECTROPHORETIC MANIPULATION OF CHEMICAL SPECIES

J. Samuel Batchelder, 85 Allison Rd., Katonah, N.Y. 10536

Filed Jul. 24, 1981, Ser. No. 286,387
Int. Cl.³ B01D 57/02; C25B 7/00; C25D 13/00
U.S. Cl. 204—180 R 20 Claims

1. An apparatus for dielectrophoretic manipulation of at least one chemical species including:

a housing for containing first and second materials, said first and second materials having different dielectric constants, at least one of said first and second materials corresponding to said chemical species to be manipulated,

means for applying a non-uniform electrical field to said first and second materials for varying the relative positions of said first and second materials within said housing as a result of dielectrophoretic forces resultant from said applied non-uniform electrical field to transport said at least one chemical species to at least one predetermined location within said housing for performing a selected operation on said chemical species at said predetermined location within said housing,

whereby the position of said at least one chemical species is manipulated to said predetermined location within said housing as a result of said dielectrophoretic forces applied thereto.

4,390,404

PROCESS FOR MANUFACTURE OF THIN-FILM MAGNETIC BUBBLE DOMAIN DETECTION DEVICE

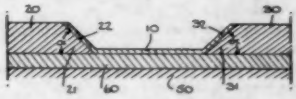
Sotaro Esho, and Hiroshi Gokan, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 36,983, May 8, 1979, Pat. No. 4,302,822. This application May 21, 1981, Ser. No. 266,105
Claims priority, application Japan, May 12, 1978, 53-56780; Feb. 14, 1979, 54-16667; Feb. 14, 1979, 54-16668
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E 6 Claims

1. A process for manufacturing a thin-film magnetic bubble domain detection device comprising the steps of:

depositing a spacer and then a conductor film onto a substrate, and removing said conductor film from a predetermined region using a mask;

thereafter depositing a magnetic field sensing film onto said substrate over an area including said predetermined region without removing said mask, and then depositing a first dielectric film onto said substrate over a second area including said predetermined region, followed by the removal of said magnetic field sensing film and said first dielectric film from the portions of said first and second areas other than said predetermined region by lifting off said first mask;



delineating said conductor film for conductor leads, sid magnetic field sensing film for a sensing element, and said first dielectric film into a detection device configuration using a second mask; and

depositing a second dielectric film without removing said second mask, and then removing said second dielectric film from said conductor film, said magnetic field sensing film and said first dielectric film by lifting off said second mask.

4,390,405

OXYGEN ELECTRODE AND METHOD FOR PREPARATION THEREOF

Allen W. Hahn; Michael F. Nichols, both of Columbia; Ashok K. Sharma, Rolla, and Eckhard W. Heilmuth, Kansas City, all of Mo., assignors to Curators of the University of Missouri, Columbia, Mo.

Continuation-in-part of Ser. No. 123,091, Feb. 20, 1980, Pat. No. 4,276,144. This application Jun. 23, 1981, Ser. No. 276,713
The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.
Int. Cl.³ B05D 3/06; G01N 27/30
U.S. Cl. 204—415 37 Claims

1. An oxygen electrode, adapted for use in polarography, galvanometry or amperometry, that is resistant to poisoning and effective for accurate, reproducible current and voltage measurements comprising a conductive sensing member having a working surface which is comprised of a metal that catalyzes the cathodic reduction of oxygen and is adapted to communicate with an oxygen-containing environment for such reduction, a layer of an oxide of said metal at said surface, an insulating jacket covering all of said member except said surface, and a thin polymeric coating over said oxide layer and securely adhered to said surface, said coating comprising a polymer produced by glow discharge polymerization of an aliphatic hydrocarbon and having such properties as to permit reduction of oxygen at said electrode by electrons supplied at said surface through said conductive member.

21. A method for producing an oxygen electrode, adapted for use in polarography, galvanometry or amperometry, that is resistant to poisoning and effective for accurate, reproducible

current and voltage measurement, the method comprising the steps of:

generating a plasma from a gas in a low pressure chamber containing the working surface of an oxygen electrode, said electrode comprising

a conductive sensing member having a working surface which is comprised of a metal that catalyzes the cathodic reduction of oxygen and is adapted to communicate with an oxygen-containing environment for such reduction, a layer of an oxide of said metal at said surface, and an insulating jacket that covers all of said member except said working surface;

introducing an aliphatic hydrocarbon gas into said low pressure chamber;

polymerizing said hydrocarbon by action of said plasma thereon; and

depositing a thin adherent coating of said polymer over said oxide layer on said working surface.

4,390,406

REPLACEABLE OUTER JUNCTION DOUBLE JUNCTION REFERENCE ELECTRODE

Kenneth J. Kato, Export, and Dominick Frollini, Jr., Trafford, both of Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 23, 1982, Ser. No. 401,257
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—435 **10 Claims**

1. A double junction reference electrode comprising:

(a) an inner body enclosing an inner chamber wherein the inner body is an elongated tube with a closed top and a closed bottom;

(b) a reference element disposed within and extending through the inner body;

(c) an outer body disposed around the inner body and enclosing an outer chamber between the inner body and the outer body wherein the outer body is an elongated tube with an inner diameter larger than the outer diameter of the inner body and with an open top and a closed bottom;

(d) an inner ion path through the inner body and providing for the flow of ions between the inner chamber and the outer chamber;

(e) an outer ion path through the outer body and providing for the flow of ions between the outer chamber and the area exterior of the outer body;

(f) means for introducing an electrolyte into the inner chamber and the outer chamber; and

(g) means for releasably joining the inner body and outer body together which includes an inner cap attached to the top of the inner body, an outer cap attached to the top of the outer body, and an engagement element located on the inner cap whereby the outer cap may be disposed around the inner cap and frictionally engage the engagement element to form a unitary electrode structure.

4,390,407

ELECTROLYTIC PROCESSING DEVICE FOR BELT-SHAPED METAL PLATES

Teruo Mori; Hiroshi Shirai; Tsutomu Kakei; Masaru Watanabe, and Tsuneyasu Matsuhisa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 24, 1981, Ser. No. 295,291
Claims priority, application Japan, Sep. 10, 1980, 55-125458
Int. Cl.³ C25D *5/02, 17/00*
U.S. Cl. 204—206 **12 Claims**

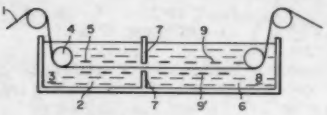
1. An electrolytic processing device comprising:

means for receiving an electrolytic solution;

means for transporting a belt-shaped metal plate through electrolytic solution in said receiving means;

first and second groups of electrodes, said first group of electrodes being positioned above a running path of said belt-shaped metal plate and said second set of electrodes being positioned below said running path of said belt-shaped metal plate; and

an electrical insulating member removably disposed between one of said groups of electrodes and said running path of said belt-shaped metal plate, wherein when said



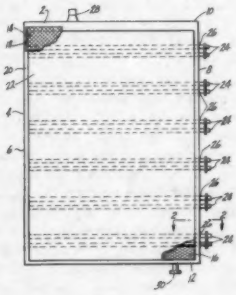
electrical insulating member is spaced between said one of said groups of electrodes and said running path of said belt-shaped metal plate, electric current flows to only one side of said metal plate, and when said electrical insulating member is removed, electrical current flows to both sides of said metal plate.

4,390,408

MEMBRANE ELECTRODE PACK CELLS DESIGNED FOR MEDIUM PRESSURE OPERATION

Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 157,918, Jun. 6, 1980, Pat. No. 4,313,812, which is a continuation-in-part of Ser. No. 128,684, Mar. 10, 1980, abandoned, and Ser. No. 143,969, Apr. 25, 1980, Pat. No. 4,312,737. This application Jun. 29, 1981, Ser. No. 278,226
Int. Cl.³ C25B *11/03*
U.S. Cl. 204—284 **18 Claims**



1. An electrode for a filter press membrane electrolytic cell, said electrode comprising:

(a) a frame having two side members, a top member and a bottom member, said frame being generally rectangular in shape and having a predetermined tensile strength and predetermined thickness;

(b) at least two vertical planar foraminous electrode surfaces of a second predetermined tensile strength conforming in shape to said frames, said surfaces being in spaced-apart parallel relationship thereby defining a plane through each of said surfaces, each of said surfaces further having a periphery defining said shape, said periphery being reinforcingly connected to said frame such that the predetermined tensile strength of said frame is at least equal to the second predetermined tensile strength of each of said surfaces in the direction of the plane of each of said surfaces;

(c) a chamber formed between said surfaces and bounded by said frame;

(d) said foraminous electrode surfaces having a predetermined surface area such that the ratio of the predetermined surface

area to the thickness of the frame is in the range of about 12.05×10^4 linear units to about 0.08×10^4 linear units;

(e) at least one process connection connected to said frame for conveying material into said chamber;

(f) at least one process connection connected to said frame for conveying material out of said chamber; and

(g) at least one conductor rod passing through one of said side members of said frame into said chamber, said conductor rod being attached to said foraminous surfaces.

4,390,409

CO-PROCESSING OF RESIDUAL OIL AND COAL

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 5, 1981, Ser. No. 271,054

Int. Cl.³ C10G *1/00, 17/00*

U.S. Cl. 208—8 LE **13 Claims**

1. A process for the volatilization and solubilization of coal and the demetallization of residual oil which comprises:

providing coal at a temperature of about 650° to about 750° F. and a metals containing residual oil at a temperature of about 900° to about 950° F. but below the incipient coking temperature of said residual oil to a processing zone maintained under conditions effective to volatilize and solubilize said coal, demetallize said residual oil and substantially prevent coking of said residual oil whereby a first volatile hydrocarbon fraction and a first non-volatile residue are produced,

separating volatilized hydrocarbon from said first non-volatile residue,

contacting the first non-volatile residue with superheated steam at a temperature of about 1150° F. to 1250° F. under stripping conditions effective to substantially prevent coking of any remaining residual oil and to provide a second volatile hydrocarbon fraction and a second non-volatile residue comprising 1150° F.+residual oil, metals from said residual oil and coal residue, and

fractionally distilling the first and second volatile hydrocarbon fractions to provide normally gaseous hydrocarbons, naphtha, gas oil and a bottoms product having a metals content substantially lower than the residual oil.

4,390,410

PROCESS FOR THE PRODUCTION OF FUELS AND METAL VALUES

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,077

Int. Cl.³ C10G *1/00, 51/02*

U.S. Cl. 208—8 LE **15 Claims**

1. A process for producing fuels from a reduced crude petroleum which comprises:

(i) vis-breaking the reduced crude to form a residue,

(ii) dealkylating the residue by contact with a transalkylation catalyst in the presence of an aromatic substrate, to form an alkylated aromatic compound and a dealkylated residue,

(iii) forming a mixture of dealkylated residue from (ii) and comminuted coal,

(iv) heating the mixture of product and coal to an elevated temperature to solubilize the coal in the dealkylated residue and demetallize the residue,

(v) separating the products of (iv) to form a liquid portion and a solid portion.

4,390,411

RECOVERY OF HYDROCARBON VALUES FROM LOW ORGANIC CARBON CONTENT CARBONACEOUS MATERIALS VIA HYDROGENATION AND SUPERCRITICAL EXTRACTION

James Scinta, and Peter J. Hart, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 2, 1981, Ser. No. 250,445

Int. Cl.³ C07G *1/00, 1/06*

U.S. Cl. 208—11 LE **8 Claims**

1. The process of recovering hydrocarbon values from carbonaceous materials selected from the group consisting of oil shale, and tar sands and mixtures thereof comprising:

(a) simultaneously contacting the material with hydrogen gas while extracting at least one hydrocarbon fraction with one or more organic solvents under supercritical pressure and at temperatures between the critical temperature of the solvent and about 100° C. above its critical temperature, and

(b) recovering at least one hydrocarbon fraction.

4,390,412

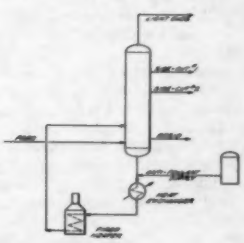
PROCESS AND COMPOSITIONS FOR REDUCING FOULING OF HEAT EXCHANGE SURFACES

Louis M. Dvoracek, Brea; Paul W. Fischer, and Milan Skripek, both of Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 958,164, Nov. 6, 1978, Pat. No. 4,319,063. This application Sep. 29, 1981, Ser. No. 306,726

Int. Cl.³ C10G *9/16*

U.S. Cl. 208—48 R **22 Claims**



1. In a process wherein a petroleum oil is contacted with a metal surface of an elevated temperature and said surface becomes fouled by the deposit of solid materials thereon, the improvement which comprises adding to said oil an N-alkylamino-alkylbenzene sulfonate, a heterocyclic amine and phenylhydrazine in amounts sufficient to reduce said fouling when said oil is contacted with a metal surface at an elevated temperature.

4,390,413

HYDROCARBON UPGRADING PROCESS

Dennis J. O'Rear, Tiburon, and Jerome F. Mayer, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 107,231, Dec. 26, 1979, Pat. No. 4,251,348, which is a continuation-in-part of Ser. No. 41,209, May 21, 1979, Pat. No. 4,282,085, which is a continuation-in-part of Ser. No. 954,062, Oct. 23, 1978, Pat. No. 4,171,257. This application Oct. 6, 1980, Ser. No. 194,729

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ C10G *11/05, 45/02*

U.S. Cl. 208—61 **28 Claims**

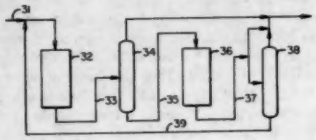
1. A process for increasing the effectiveness of hydrocarbon processing, comprising:

(a) hydrocracking a hydrocarbonaceous feedstock having a

normal boiling range above about 180° F. and below about 1200° F.;

(b) upgrading at least part of the effluent of said hydrocracking process through use of an upgrading process comprising,

(i) producing a process stream containing at least a substantial amount of C_3 to C_4 olefins by contacting said effluent part with a catalyst comprising a ZSM-5-type crystalline aluminosilicate zeolite in a form which is substantially free



of hydrogenation activity, said contacting being under conditions including (a) a temperature in the range of from about 500° F. to about 800° F.; (b) a pressure below about 13 atmospheres gauge; and (c) a liquid hourly spaced velocity in the range of from about 0.1 to 20, said effluent having a content of nitrogen-containing impurities, calculated by weight as nitrogen, below about 5 ppm; and

(c) etherating all or part of the portion of said process stream which boils below about 225° F.

4,390,414

SELECTIVE DEWAXING OF HYDROCARBON OIL USING SURFACE-MODIFIED ZEOLITES

Ian A. Cody, Sarnia, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 16, 1981, Ser. No. 331,262
Int. Cl.³ C10G *47/18*
U.S. Cl. 208—111 **23 Claims**

1. A method for selectively dewaxing a waxy hydrocarbon oil feedstock and enhancing the yield of dewaxed oil which method comprises contacting said waxy hydrocarbon oil stock in the presence of hydrogen and under conditions of pressure, temperature and flow velocity sufficient to effect the dewaxing with a silylated zeolite, which silylated zeolite is prepared from a zeolite which (1) has been modified by reaction under anhydrous conditions with an organosilane wherein the zeolite to be modified possesses reactive sites capable of reacting with the organosilane and wherein the organosilane is capable of entering into the channels of the zeolite and reacting with the reactive sites present therein as well as reacting with reactive sites present on the external surface of said zeolite and (2) has been loaded with a catalytically active hydrogenating metal component.

4,390,415

HIGH METAL CARBO-METALLIC OIL CONVERSION USING LOW INVENTORY OF CATALYST

George D. Myers, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

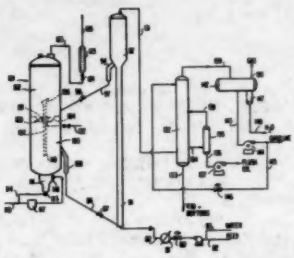
Division of Ser. No. 94,092, Nov. 14, 1979, Pat. No. 4,332,673. This application Sep. 29, 1981, Ser. No. 306,813
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—113 **4 Claims**

1. A process for economically converting carbo-metallic oils to lighter products, comprising:

I. providing a converter feed containing 650° F+ material, said 650° F.+ material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s);

II. bringing said converter feed together with cracking catalyst to form a stream comprising a suspension of said catalyst in said feed, causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900 to about 1400° F. and under a total pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

III. separating said catalyst from the resultant cracking products;



IV. stripping hydrocarbons from said separated catalyst;

V. regenerating said catalyst with oxygen-containing combustion-supporting gas under conditions of time, temperature and atmosphere sufficient to reduce the carbon on the catalyst to about 0.25% by weight or less, while forming gaseous combustion product gases comprising CO and/or CO_2;

VI. recycling the regenerated catalyst to the reactor for contact with fresh feed; and

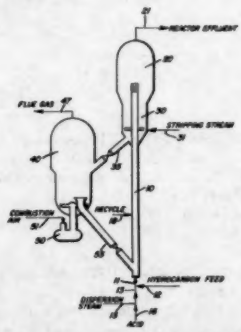
VII. maintaining the total inventory of catalyst in circulation in the process in the range of about 12 tons or less per 1000 barrels of daily plant throughput.

4,390,416

CATALYTIC CRACKING OF HYDROCARBONS

Ronald E. Ritter, Ellicott City, and Donald S. Henderson, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,996
Int. Cl.³ C10G *11/02, 11/04*
U.S. Cl. 208—120 **9 Claims**



1. In a method for the catalytic cracking of nitrogen containing hydrocarbon feedstocks wherein the feedstock is contacted with a catalyst under catalytic cracking conditions at elevated temperatures, the improvement comprising adding to said feedstock immediately prior to contact with said catalyst an amount of acid selected from the group consisting of sulfuric, hydrochloric, nitric, phosphoric and acetic acids sufficient to neutralize a substantial portion of the basic nitrogen components contained in said feedstock.

4,390,417

METHOD FOR DEWATERING NON-AQUEOUS LIQUIDS

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 20, 1981, Ser. No. 285,197
Int. Cl.³ B01D 33/04
U.S. Cl. 208—188 10 Claims

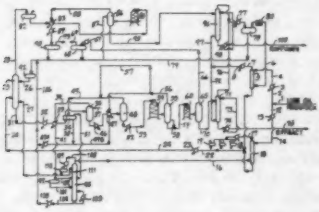
1. The method for dewatering a flowing stream of non-aqueous liquid containing water therein which comprises determining the content of water in said flowing stream of non-aqueous liquid at a point adjacent to a water-sensing probe in said flowing stream, passing at least a portion of said flowing stream from said point adjacent to said water-sensing probe to the entrance of a body of acid resin catalyst, generating a signal in said water-sensing probe in accordance with the water content detected by said water-sensing probe, adding at least one dewatering chemical selected from the group consisting of ketal, acetal, and orthoester to said portion of said flowing stream in accordance with said signal, at a point between said probe and said entrance to said body of acid resin catalyst, passing said portion of said flowing stream and said added dewatering chemical into contact with said body of acid resin catalyst wherein said dewatering chemical reacts with said water and decreases the water content of said portion, and returning said portion to said flowing stream thereby forming a flowing stream of decreased water content, and recovering said flowing stream of decreased water content.

4,390,418

RECOVERY OF SOLVENT IN HYDROCARBON PROCESSING SYSTEMS

Philip B. Sherman, Orange, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1982, Ser. No. 377,293
Int. Cl.³ C10G 21/06, 21/20
U.S. Cl. 208—326 12 Claims



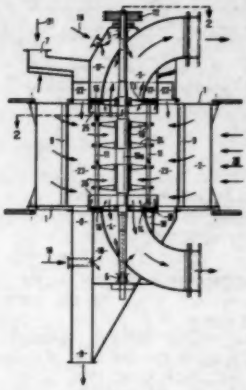
1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted under pressure with N-methyl-2-pyrrolidone as a selective solvent for aromatic constituents of said feedstock in an extraction zone under solvent refining conditions thereby forming a raffinate phase comprising a minor amount of said solvent and an extract phase comprising extract and a major amount of said solvent, said raffinate phase is separated from said extract phase, and said solvent is removed from said extract by vaporization serially in a first solvent vaporization zone at a pressure less than that of said extraction zone and in a plurality of zones at progressively higher pressure and wherein heat from an external source is supplied only to said last high pressure vaporization zone and heat for each preceding vaporization zone is supplied by heat exchange with vapors from each succeeding vaporization zone, the improvement which comprises passing a minor portion of the vapors from said last high pressure vaporization zone into admixture with vapors from the next preceding vaporization zone to supply additional heat to said first solvent vaporization zone.

4,390,419

CENTRIFUGAL CLASSIFIER

Ulrich Barthelmess, Niederstotzingen, Fed. Rep. of Germany, assignor to OMYA GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,027
Int. Cl.³ B07B 7/083
U.S. Cl. 209—11 7 Claims



1. An improved centrifugal classifier, comprising:

a substantially cylindrical housing having an approximately tangential inlet for classifying air;

a vane ring arranged centrally within said housing and spaced radially inwardly from the casing thereof, said vane ring being of approximately the same axial length as said inlet for classifying air;

a classifying rotor arranged for rotation within and spaced radially inwardly from said vane ring, said rotor also being of approximately the same axial length as said inlet for classifying air and comprising a circumferentially and axially extending lamination ring defining radially extending passages leading from the outside diameter of said rotor to an axially extending interior volume in said rotor, said interior volume being open along its axial length to flow of air and fine granular material passing from said radial passages toward both ends of said interior volume and defining an inside diameter for said rotor;

an inlet for granular material to be classified, said inlet opening into a classifying area located between said vane ring and said lamination ring;

a first outlet for coarse granular material and air, said first outlet opening from said classifying area; and

second and third outlets for fine granular material and air, said second outlet being located at one end of said interior volume and said third outlet being located at the other end of said interior volume, the diameters of said second and third outlets corresponding approximately to said inside diameter of said rotor.

4,390,420

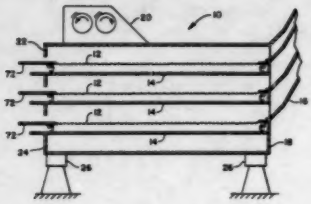
WIRE CLOTH TENSIONING APPARATUS

Peter H. Tenhaaf, St. Catherines, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 12, 1981, Ser. No. 320,258
Int. Cl.³ B07B 1/48
U.S. Cl. 209—403 6 Claims

1. In a screening apparatus, a frame, support means for attaching the screen within said frame, said support means including a folded over edge portion of the screen on at least two opposite sides along their entire edges, means for securing the folded over edge portion to the inner portion of the screen, thus forming passage means enclosed by the screen which

extends along the two opposite sides, rod means extending through the passage means on the two opposite sides of the screen, a plurality of spaced openings formed in the screen on



each said opposite side thereof, through which the rod means are exposed, and resilient means for securing the rod means to the frame at each of the spaced openings.

4,390,421

SEPARATOR FOR LOW VISCOSITY FLUIDS

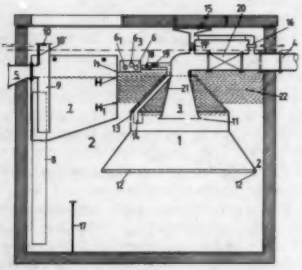
Nikolaus Hammerschmitt, Kölner Str. 138, D-5350 Euskirchen, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 253,911

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014204; Jun. 23, 1980, 3023384

Int. Cl.³ B01D *21/10*

U.S. Cl. 210—86 **22 Claims**



1. A device for continuously separating the components of a liquid mixture of different specific weights, especially for separating a light liquid, as for instance oil or gasoline etc., from a heavy liquid, as for instance water, heavy substances or slurry, said device comprising:

a container;

a partition disposed in said container and separating the same into a separation chamber and a receiving chamber for the heavy liquid and providing a connection of the chambers in the lower container portion;

an inlet for the liquid mixture into said separation chamber;

an outlet for the heavy liquid from said heavy liquid receiving chamber and an outlet for the light liquid from the separation chamber disposed higher than the level of the heavy liquid;

said separation chamber having at least one deflecting surface providing a narrowed sectional area of flow for the liquid mixture and opening into an area with large flow section, said deflecting surface being disposed in the upper portion of said separation chamber (1, 1', 69) to cause a substantially vertically downwardly directed liquid flow, said separation chamber having an area with large flow section disposed in the lower part (1, 1', 69) adjacent to the connection to the receiving chamber (2, 70) for the heavy liquid, said separating chamber having an area free of flow on the side of the deflecting surface opposite to the liquid flow serving as light liquid collecting chamber (21, 21') which includes the outlet (6) for the light liquid,

said receiving chamber (2, 70) for the heavy liquid being a second separation chamber having a substantially greater volume than the first separation chamber and having a second light liquid outlet (6_1), and

said heavy liquid outlet being defined by a baffle plate in said receiving chamber substantially spaced from the first separation chamber.

4,390,422

APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WATER

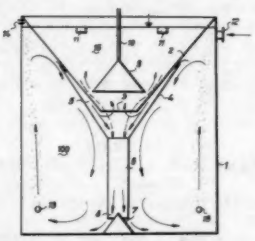
Svatopluk Mackrle, Brno; Vladimir Mackrle, Prague, and Oldrich Dracka, Brno, all of Czechoslovakia, assignors to Agrotechnika, narodni podnik, Zvolen, Czechoslovakia

Filed Jun. 15, 1979, Ser. No. 48,813

Claims priority, application Czechoslovakia, Jun. 15, 1978, 3924-78

Int. Cl.³ B01D *19/00;* **C02F** *3/22*

U.S. Cl. 210—188 **4 Claims**



1. In an apparatus for the biological purification of water with the separation of activated sludge by fluid filtration with the spontaneous returning of activated sludge into the activation area, said apparatus having a tank containing the activation area and the separation area, said separation area being arranged above the activation area, means for aerating the sludge in the activation area, means for escape of the used air from the activation area, and means providing a passage for conducting water with activated sludge from the activation area into the separation area, said passage being defined as a passage where downwards directed stream of water is turned upwards into the separation area, the improvement which comprises a bubble trap having a cavity, the lower end of which is open downwardly, said bubble trap being arranged above the upper end of the passage for the transition of water with activated sludge from the activation area into the separation area, the downwardly open lower end of the bubble trap horizontally overlapping the perpendicular projection of said passage, and means providing for the discharge of air from the upper part of the cavity in the bubble trap.

4,390,423

APPARATUS FOR MAGNETIC TREATMENT OF A FLOWING LIQUID

Eilert Sundt, Sandefjord, Norway, assignor to Olaf Fjeldsend A/S, Sandefjord, Norway

PCT No. PCT/NO80/00030, § 371 Date Jun. 19, 1981, § 102(e) Date Jun. 19, 1981, PCT Pub. No. WO81/01112, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 28, 1980, Ser. No. 276,368

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—222 **8 Claims**

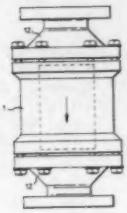
1. An apparatus for the magnetic treatment of a flowing liquid which comprises

an elongated housing which is made at least in part of a

ferromagnetic material, said housing providing a liquid flow channel therethrough having an inlet end and an outlet end,

at least one elongated permanent magnet positioned in said housing, each permanent magnet having pole surfaces on opposing sides thereof,

at least one elongated pole shoe associated with each premanent magnet, each pole shoe being positioned adjacent a pole surface of the associated permanent magnet and each



pole shoe including a least one elongated projection portion which extends away from the adjacent pole surface of the associated permanent magnet and into the flow channel so as to form an associated elongated gap through which the liquid passing along the liquid flow channel must flow, each projection portion and thus each gap extending at an acute angle with respect to the flow direction of the liquid passing along the liquid flow channel in said housing.

4,390,424

DEVICE FOR DIFFUSING MATTER BETWEEN TWO FLUIDS VIA SEMI-PERMEABLE DIAPHRAGMS

Gerhard Riede, Vellinge, Sweden, assignor to Gambro AG, Switzerland

Division of Ser. No. 716,479, Aug. 23, 1976, Pat. No. 4,224,159. This application Mar. 14, 1980, Ser. No. 130,456
Claims priority, application Sweden, Sep. 11, 1975, 7510097
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—232 **4 Claims**

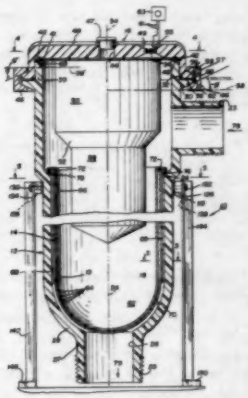
1. In an apparatus for diffusing matter between two fluids, said apparatus comprising a plurality of spacing plates; a plurality of pairs of semi-permeable membranes, said spacing plates including flow passages for each of said fluids so that, when said spacing plates and said pairs of semi-permeable membranes are arranged in a stacked configuration, one of said fluids may be passed between said membranes of said pairs of semi-permeable membranes and said other fluid may be passed between said spacing plates and said pairs of semi-permeable membranes; a first clamping plate; a second clamping plate; and means for clamping said first clamping plate to said second clamping plate with said stacked configuration pressed therebetween, the improvement which comprises: (1) said first clamping plate including (a) a pair of laterally extending side walls including a first side wall section, a second side wall section, and an intermediate side wall section therebetween, wherein said second side wall section is displaced outwardly with respect to said first side wall section and wherein said intermediate side wall section obliquely connects said first side wall section and said second side wall section so that at least a portion of said second clamping plate is disposed within said second side wall sections of said laterally extending side walls of said first clamping plate when said first and second clamping plates are clamped together, and (b) a plurality of apertures in said laterally extending side walls, wherein said plurality of apertures are located in said intermediate side wall section of said laterally extending side walls of said first clamping plate, whereby the manufacture of said first clamping plate by extrusion processes is substantially simplified; and (2) said second clamping plate including a plurality of outwardly extending locking members for engaging said apertures of said side walls of said first clamping plate to said second clamping plate at a plurality of locations around the periphery of said apparatus in order to contain said stacked configuration under increased pressure therebetween.

4,390,425

HIGH PRESSURE LIQUID FILTER VESSEL

Peter T. Tafara, 4803 Spring St., Neptune, N.J. 07753, and Warren R. Fink, 23 Arbor Way, Wayside, N.J. 07712

Filed Mar. 19, 1982, Ser. No. 359,918
Int. Cl.³ B01D *29/00*
U.S. Cl. 210—232 **14 Claims**



1. A high pressure liquid filter vessel comprising:

(a) an elongated hollow housing having an open end and a closed end, said housing being provided with an internally protruding ledge disposed away from said open end, inlet and outlet means and a circumferentially outwardly extending flange portion disposed proximate said open end, said inlet means being disposed between said ledge and said open end, said outlet means being generally centrally disposed in said closed end, said outwardly extending flange portion being provided with an upper surface generally perpendicular to the longitudinal axis of said housing and a lower surface sloped towards said flange upper surface at an acute angle from a line drawn perpendicular to said axis;

(b) a filter bag having a roll-over ringed edge;

(c) porous basket means disposed within said housing having a plurality of axially disposed and closely spaced external ribs for strengthening said basket means and positioning said basket means away from the internal wall of said housing to enhance the liquid flow and an outwardly extending flange portion for cooperating with said housing ledge and centrally positioning said basket means within said housing while simultaneously positioning and retaining said roll-over edge of said filter bag between said flange portion and said housing ledge;

(d) cover means for cooperating with said housing open end and sealing it, said cover means being provided with a

circumferentially outwardly extending flange portion and a centrally disposed extending portion adapted to be received by said filter bag and basket means, said outwardly extending flange portion being provided with a lower surface generally perpendicular to the longitudinal axis of said housing and an upper surface sloped towards said flange lower surface at an acute angle from a line drawn perpendicular to said housing axis;

(e) circular non-resilient bracket means formed in two halves and each being provided with a pair of inwardly extending sloped surfaces at the same acute angle as provided on said housing sloped surface and said cover means sloped surface and adapted to cooperate therewith; and

(f) fastening means disposed proximate the ends of each of said bracket means for positioning said bracket means in its original circular shape while retaining said housing and cover means in sealed relationship between said bracket means sloped surfaces.

4,390,426

CENTRIFUGAL SEPARATORS OF THE CYCLONE TYPE

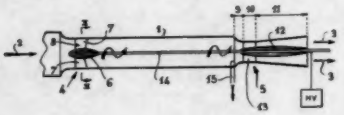
Pierre G. Vicard, Lyons, France, assignor to Societe Lab, Lyons, France

Continuation of Ser. No. 203,186, Nov. 3, 1980, abandoned. This application May 25, 1982, Ser. No. 381,981

Claims priority, application France, Nov. 8, 1979, 79 28023

Int. Cl.³ B03C *3/14, 3/36, 5/02*

U.S. Cl. 210—243 **1 Claim**



1. A cyclone separator for the centrifugal separation of solid or liquid particles suspended in a fluid wherein the fluid is whirled about an axis and displaced therealong, the separator comprising:

a tubular body surrounding said axis and having an upstream inlet end and a downstream outlet end;

an inlet device at the inlet end of the body and comprising a first insulating core surrounding said axis and supporting inlet blades extending between said core and said tubular body, the blades being disposed to impart whirling motion to fluid flowing axially through said body, said inlet blades as viewed in transverse cross section taken normal to said axis being shaped to provide on each blade convex side walls mutually converging from the core toward the body and leaving between the blades trapezoidal spaces having parallel inner and outer boundaries and concave non-parallel side boundaries which diverge outwardly from the core toward the body;

an outlet device at the outlet end of the body and comprising an upstream convergent stage, an intermediate stage coupled to the upstream stage, a divergent downstream stage coupled to the intermediate stage, a second insulating core surrounding the axis within the outlet device, and outlet blades extending from said core to said tubular body in said intermediate stage and operative to rectify the flow of the fluid to remove its whirling motion about said axis;

an electrode extending along said axis and being supported by said cores, and having an end extending beyond the outlet device into a zone where the particles have been removed and the fluid is no longer whirling;

a voltage supply generator connected to said extended end of the electrode; and

a lateral discharge extending from the tubular body adjacent to the upstream end of said outlet device and operative to discharge separated particles.

4,390,427

PLATE-TYPE FILTER

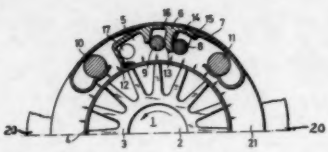
Dieter Hünten, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,317

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034678

Int. Cl.³ B01B *33/02*

U.S. Cl. 210—333.01 **3 Claims**



1. A plate-type filter for filtering dirt from a medium, said filter intended for insertion in a cylindrical housing which has an inlet for dirty medium and an outlet for filtered medium, said filter comprising:

two face plates which are spaced from one another and are secured to said housing, one of said face plates being provided with a rinse-out opening which is in communication with said outlet of said housing;

a valve operatively connected to said rinse-out opening for opening and closing same;

a cylindrical filter element comprising a plate-type cylinder which has a cylindrical outer surface, said cylinder being rotatably arranged in said housing between said face plates, and being in communication with said inlet of said housing for receiving dirty medium within said cylinder;

a U-shaped piece which is open toward said rinse-out opening and spans a portion of said cylindrical outer surface of said cylinder, said U-shaped piece, when viewed in the direction of rotation of said cylinder, having a front leg and a rear leg, said rear leg forming a wiper body and being in constant engagement with an axial length of said cylindrical surface of said cylinder; and

an adjustment member associated with one of said face plates and with said U-shaped piece for lifting said front leg from said cylindrical surface of said cylinder, and for pressing said front leg against said cylindrical surface to form a rinsing channel defined by said face plates, said cylindrical surface of said cylinder, and said U-shaped piece, said rinsing channel being in communication with said rinse-out opening for receiving a partial reverse flow of filtered medium from within, and through that portion of, said cylindrical surface of said cylinder spanned by said U-shaped piece for effecting cleaning of said cylindrical surface.

4,390,428

FILTRATION APPARATUS

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Filed Nov. 6, 1981, Ser. No. 318,713

Int. Cl.³ B01D *29/02*

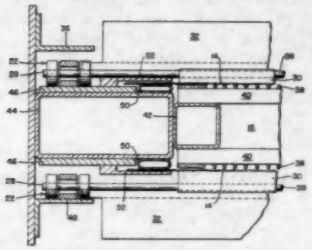
U.S. Cl. 210—400 **1 Claim**

1. In a filtering apparatus of the type wherein contaminated liquid is supplied to a tank and caused by differential pressure to flow through a submerged perforate filter means into the inlet in the top wall of a submerged filter box, filter means including an endless loop perforate filter belt which circumscribes the filter box, means for removing filtrate liquid from the filter box, a power driven conveyor comprising transverse flight bars spanning the filter belt above the upper reach of the filter belt and connected thereto at points intermediate the

longitudinal edges of the belt to selectively advance the normally stationary filter means in response to a build-up of dirt thereon to bring clean filter means into registry with the filter box inlet, the improved means for preventing leakage of unfiltered liquid around the longitudinal edges of the filter belt and into the filter box which comprises:

the longitudinally extending edges of the filter belt projecting laterally outwardly beyond the lateral edges of the filter box inlet and into a space between upper and lower continuous longitudinally extending substantially rigid members, said upper rigid member being located above said filter belt edge and beneath the flight bars;

belt sealing means comprising tubing which is resiliently collapsible in cross-section, such tubing extending longitudinally along and in abutting contact with each of said longitudinally extending edges of the upper reach of said filter belt and being normally compressed between the lower surface of said upper belt reach and said lower rigid member;



pressurizing means for selectively pressurizing the interior of the tubing thereby tending to expand said tubing to increase the compression force against said belt edges to establish a tight seal between said belt edges and said lower rigid members and to press said belt edges upward against said upper rigid members, thereby to prevent leakage around said longitudinal edges and into the filter box, said upper rigid members serving as reaction members for the compression force created by said pressurized tubing.

4,390,429

DECANTER FOR DECANTING A FLUID

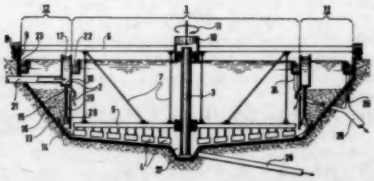
Pierre Lejeune, and Jean Serpaud, both of Grenoble, France, assignors to Societe Anonyme dite: Alstrom-Atlantique, Paris, France

Filed Nov. 17, 1981, Ser. No. 322,129

Claims priority, application France, Nov. 20, 1980, 80 24627

Int. Cl.³ B01D *21/14, 21/24*

U.S. Cl. 210—519 **4 Claims**



1. A decanter for decanting a fluid charged with solid particles, said decanter comprising:

a first circular decanting tank including a circular bottom wall inclined slightly toward the center thereof;

a sludge scraper system wholly within said first tank and mounted adjacent the circular bottom wall for scraping the sludge at the bottom of the tank and for moving said sludge toward the center of said first tank;

a second sludge bed annular tank concentrically surrounding said first tank, said annular tank being formed by an inclined wall inclining outwardly and upwardly and being connected at its bottom to said circular bottom wall of said first tank and having a vertical wall radially inwardly of said annular tank inclined wall and forming a common wall with said first tank;

an annular manifold located within said decanter, at the top of said second tank, said first and second tanks having overflow volumes to remove fluid free of solid particles from said first and second tanks;

said common wall having a first set of openings located at an intermediate level between the bottom of said second tank and the liquid surface of accumulated liquid within said first and second tanks, and a second set of openings near the bottom of said common wall for communicating said second tank to said first tank;

and wherein said manifold includes means for feeding fluid thereto including means communicating the bottom of said manifold to the bottom of said second tank in the vicinity of said second set of openings; whereby, dirty fluid fed to said annular manifold enters said second tank and passes upwardly through a sludge bed formed within said second tank to enter said first chamber through said first set of openings, while some of said dirty fluid enters said first tank through said second set of openings along with sludge which descends slowly onto the inclined bottom wall of said first tank where said sludge is conveyed by the moving scrapers towards the center of said first tank and means for removing conveyed sludge from the center of said first tank at the bottom thereof, and wherein said first set of openings permits an appreciable volume of water to pass from said second tank to said first tank to maintain the sludge bed at a constant level by allowing some sludge to pour out through said first openings with said dirty liquid.

4,390,430

APPARATUS FOR SCRAPING SLUDGE FROM THE SURFACE OF A BODY OF LIQUID

Johannes van Leeuwen, Santpoort, Netherlands, assignor to Esmil B.V., Amsterdam, Netherlands

Filed Feb. 25, 1981, Ser. No. 237,866

Claims priority, application Netherlands, Feb. 28, 1980, 8001198

Int. Cl.³ B01D *21/04*

U.S. Cl. 210—527 **7 Claims**

1. Apparatus for scraping sludge from the surface of a body of liquid on which the said sludge is floating, comprising

(a) a container for the liquid,

(b) a sludge stabilization grid mounted in the container so as to be, in use of the apparatus, adjacent the surface of the liquid so that the floating sludge protrudes upwardly through the grid,

(c) a sludge gutter extending alongside said container to receive sludge removed from the liquid surface,

(d) a knife for removing said sludge protruding through the grid having a longitudinal free edge,

(e) drive means for moving said knife in a forward move-

ment across said grid towards said gutter and in a return movement away from said gutter, and

(f) support means for said knife adapted and arranged so that (i) the knife is in a working position tilted downwardly towards said free edge during said forward movement in order to cut the sludge protruding through the grid and push it into the gutter and (ii) the knife is in a retracted position during said return movement with said free edge raised above its level adopted in said working position wherein said support means includes an electromagnet which is actuable during said return movement in order to maintain the knife in said retracted position.

4,390,431

PROCESS FOR TREATING AQUEOUS STREAMS CONTAINING ALUMINUM

Pierre Amigues, La Muladiere; Yves Chauvin, Le Pecq; Dominique Commereuc, Meudon; Jean Gaillard, Lyons, and Nhu H. Phung, Antony, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 8, 1981, Ser. No. 261,818

Claims priority, application France, May 8, 1980, 80 10360

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—724 **8 Claims**

1. A process for removing aluminum values from a basic aqueous phase containing a water-soluble aluminum compound in solution, said basic aqueous phase resulting from the destruction of at least one of a hydrocarbon dimerization or oligomerization catalyst comprising a hydrocarbon-soluble aluminum compound and nickel by basic washing of a hydrocarbon phase containing said catalyst with an aqueous sodium hydroxide or potassium hydroxide solution, said process comprising neutralizing said aqueous phase with acid to bring it to pH of from 6 to 8.5, treating the resultant neutralized aqueous phase with an additive, said additive being an alkaline earth metal oxide, hydroxide or carbonate or a mixture thereof, at a temperature of from 90° C. to the boiling point of said aqueous phase, the molar ratio of the additive to aluminum being from 1/10 to 10/1, for a time sufficient to form an insoluble phase of precipitate, and thereafter separating the resultant aqueous phase, from the insoluble phase of precipitate.

4,390,432

METHOD OF PURIFYING WATER IN FISH KEEPING WATER TANK

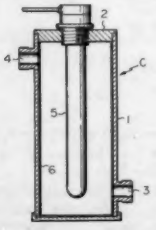
Masanobu Takeguchi, and Isao Oyobe, both of Fujisawa, Japan, assignors to Marui Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 137,269, Apr. 4, 1980, Pat. No. 4,297,222. This application Aug. 6, 1981, Ser. No. 290,565

The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.

Int. Cl.³ C02B *1/38*

U.S. Cl. 210—748 **5 Claims**



1. A method of purifying water in a fish keeping water tank comprising:

(A) circulating water at a rate such that at least half the volume of water in the tank is circulated per hour;

(B) passing the water through a UV irradiation vessel providing UV radiation having a predominant wavelength of less than 280 nm, wherein the water is exposed to at least 170 μW.min/cm^2 of UV radiation at one pass through said vessel, or a given volume of water is exposed to a total of at least 1000 μW.min/cm^2 of UV radiation during a one-hour circulation of the water; and

(C) introducing the water into a purifying tank having an inlet and an outlet and which includes a support cylinder wrapped with a microorganism-growing bed of free-permeable nonwoven fabric made of synthetic resin and having a predetermined mesh size no smaller than 100μ, passing all of said water through said growing bed, to thereby bring the introduced water into contact with microorganisms deposited on said growing bed, and to separate some of said microorganisms from said growing bed, introducing said water into a space in said purifying tank downstream from said microorganism growing bed, where microorganisms separated from said growing bed are suspended and grow, to thereby bring the water into contact with such microorganisms in said space.

4,390,433

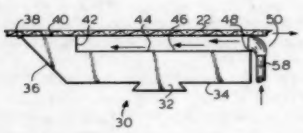
DEWATERING SYSTEM WITH WATER DECKLE

Jeffrey B. Duncan, Argyle, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,300

Int. Cl.³ B01A *29/02*

U.S. Cl. 210—767 **18 Claims**



1. In a deliquefying system including at least one drainage device having a wear surface and connected to a source of suction open to the wear surface and means for passing a wet web of material to be deliquefied over the wear surface so that liquid is removed from the web by the drainage device, the improvement comprising; a liquid deckle including means for injecting liquid under relatively high pressure into a substantial space at each end of the drainage device in position to prevent air from entering the drainage device through the end zone and thereby restricting the flow of air to passage through the wet web into the drainage device.

4,390,434

USE OF 4-METHYL-3-CYCLOHEXENE-1-CARBOXYLIC ACID FOR ENHANCING OR AUGMENTING THE AROMA OF FABRIC SOFTENER COMPOSITIONS OR DRIER-ADDED ARTICLES

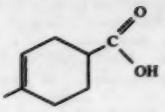
Nicholas Calderone, Laurel Hollow, N.Y.; Hugh Watkins, Lincroft, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 229,211, Sep. 3, 1981. This application Jun. 24, 1982, Ser. No. 391,592

Int. Cl.³ D06M *13/20*

U.S. Cl. 252—8.6 **1 Claim**

1. A process for augmenting or enhancing the aroma of a fabric softener composition or drier-added fabric softener article comprising the step of adding to a fabric softener composition base or drier-added fabric softener article component, an aroma augmenting or enhancing quantity of 4-methyl-3-cyclohexene-1-carboxylic acid defined according to the structure:



4,390,435

OXOALKYL ESTERS, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

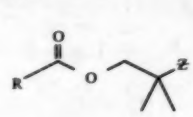
Michael Licciardello, Farmingdale; Richard M. Boden, Monmouth Beach; Hugh Watkins, Lincroft, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 307,366, Oct. 1, 1981, Pat. No. 4,368,145. This application Jul. 8, 1982, Ser. No. 396,252

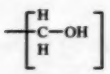
Int. Cl.³ D06M *13/12*

U.S. Cl. 252—8.6 5 Claims

1. A process for augmenting or enhancing the aroma of a fabric softener article or a fabric softener composition comprising the step of adding to a fabric softener article component or a fabric softener base composition, an aroma augmenting or enhancing quantity of at least one oxoalkyl ester defined according to the structure:



wherein Z is a moiety selected from the group consisting of carbinol having the structure:



and carboxyaldehyde having the structure:

and R is selected from the group consisting of 3-heptanyl and phenyl.

4,390,436

AQUEOUS FILM FORMING LUBRICANT USEFUL IN A METHOD FOR DRAWING ALUMINUM AND OTHER SOFT METALS

Pablo M. Hernandez, Waukegan, Ill., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 8, 1982, Ser. No. 346,711

Int. Cl.³ C10M *1/06*

U.S. Cl. 252—49.3 3 Claims

1. In a method of forming containers from a soft metal comprising coating a lubricant on said metal at a coating weight of from about 10 to 40 mg. per square foot; forming a cup from said coated soft metal at a hold-down pressure of up to 2,500 psi.; drawing said cup to form a container; and removing said lubricant; the improvement which comprises using as said lubricant a composition comprising from about 1 to 10% by weight of a compound having a melt point of less than 50° C. selected from the group consisting of lanolin, petrolatum and mixtures thereof; from about 5 to 20% by weight of a wax having a melt point of less than 65° C. selected from paraffin wax, hydrogenated castor wax, bees wax and mixtures thereof; from about 1 to 10% by weight of a fatty acid; from about 0.25 to 5% by weight of an amine selected from the group consisting of morpholine, diethylamine ethanolamine, substituted morpholine and mixtures thereof; from about 0.1 to 2% by weight of a thickener and water comprising the balance.

4,390,437

LUBRICANT ANTIOXIDANTS

Richard J. Lee, Downers Grove, Ill., and Lynn M. R. Murphy, Lafayette, La., assignors to Standard Oil Company (Indiana), Chicago, Ill.

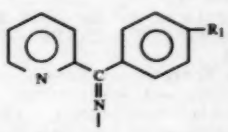
Filed Jul. 20, 1979, Ser. No. 59,246

Int. Cl.³ C10M *1/20, 1/32*; C07D *211/70, 401/00*

U.S. Cl. 252—51.5 A 6 Claims

1. A lubricating oil composition resistant to oxidative deterioration comprising a major proportion of hydrocarbon oil and about 0.1% to 10% of an additive having the structure $A[(X)_{m-1}Y]_n$ wherein:

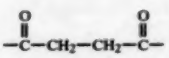
(a) A is an antioxidant functional moiety comprising pyridyl phenyl ketimine having the structure



wherein R_1 is hydrogen, alkyl, alkenyl, or aryl, and

(b) $[(X)_{m-1}Y]_n$ is an oil soluble moiety wherein

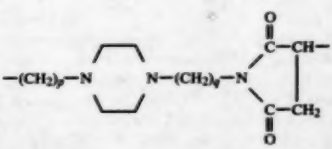
(1) X is a divalent member connected directly to A and Y respectively, and is selected from the group consisting of succinyl, imine, amino, and dialkyl piperazine succinimide having the structures



(i)

(ii)

(iii)



(iv)

wherein p and q are whole numbers from 1 to 6,

(2) m is a whole number from 1 to 2,

(3) Y is a monovalent aliphatic chain of from 12 to 50 carbon atoms whose valence is connected directly to X when m is 2 and directly to A when m is 1,

(4) n is a whole number from 1 to 2 and corresponds to the number of free valences in A.

4,390,438

DIBASIC ACIDS TO REDUCE COEFFICIENT OF FRICTION IN ROLLING OILS

Carl S. Kennedy, Dyer, Ind., and Fred Zellmann, Evergreen Park, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 16, 1981, Ser. No. 312,066
Int. Cl.³ C10M 1/24
U.S. Cl. 252—56 D 3 Claims

1. In an improved high animal fat content rolling oil formulation used in cold rolling sheet steel and steel strip for tinplate, comprising a major portion of a refined animal fat, minor portions of lubricity additives, anti-oxidants and emulsifiers, the improvement comprising the further inclusion of a friction reducing amount of at least 0.2 weight percent of a saturated dibasic acid containing from 4–14 carbon atoms.

2. The improved high content animal fat rolling oil of claim 1 wherein the saturated dibasic acid is chosen from the group consisting of adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, and mixtures thereof.

4,390,439

WATER-BASED HYDRAULIC FLUIDS HAVING IMPROVED LUBRICITY AND CORROSION INHIBITING PROPERTIES EMPLOYING NEODECANOIC ACID

Ellen S. Schwartz, Warren, and Cline A. Tincher, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 30, 1981, Ser. No. 249,200
Int. Cl.³ C09K 3/00; C10M 3/04
U.S. Cl. 252—73 14 Claims

1. A hydraulic fluid concentrate characterized by improved anti-wear and corrosion inhibiting properties comprising water, neodecanoic acid in the amount of about 0.3 to 20.0 percent by weight of said concentrate, a polyether thickener having a molecular weight of about 1000 to about 75,000 prepared by reacting ethylene oxide or ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing polyhydric alcohol initiator and at least one α-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said α-olefin oxide is present in the amount of about 1 to about 20 percent by weight based upon the total weight of said polyether thickener, and conventional hydraulic fluid additives.

4,390,440

THICKENED WATER-BASED HYDRAULIC FLUIDS

Ellen S. Schwartz, Warren, and Cline A. Tichner, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 8, 1981, Ser. No. 271,593
Int. Cl.³ C10M 3/04, 3/18, 3/22
U.S. Cl. 252—76 42 Claims

1. In a hydraulic fluid composition containing conventional hydraulic fluid additives, the improvement wherein said hydraulic fluid is characterized by improved viscosity said fluid consisting essentially of water, a carboxylic acid having about 5 to 20 carbon atoms, a thickener which is a polyether polyol having a molecular weight of about 1000 to about 40,000 prepared by reacting ethylene oxide or ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing compound and at least one alpha-olefin oxide or alcohol or glycidyl ether having a carbon chain length of about 10 to about 24 aliphatic carbon atoms wherein said alpha-olefin oxide or alcohol or glycidyl ether is present in the amount of 1 to about 20 percent by weight based upon the total weight of said thickener.

4,390,441

MACHINE DISHWASHING COMPOSITION

Stuart W. Beavan, Birkenhead, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,035
Claims priority, application United Kingdom, Apr. 11, 1980, 8012050
Int. Cl.³ C11D 9/42
U.S. Cl. 252—96 6 Claims

1. A machine dishwashing composition for use in a dishwashing machine provided with a source of ultra-violet light having a wavelength of between 200 nm and 400 nm to irradiate the dishes and/or the washing liquor during the wash programme, said composition comprising:

(i) 10 to 60% by weight of a builder material, which removes calcium ions from solution by sequestration, complexation precipitation or ion-exchange;

(ii) 5 to 45% by weight of a material yielding halite ions in aqueous media;

(iii) sufficient alkaline material to give the composition a pH of above 7 when dispersed at 0.5 g/l in water; and

(iv) 0 to 15% by weight of a low or non-foaming nonionic surfactant.

4,390,442

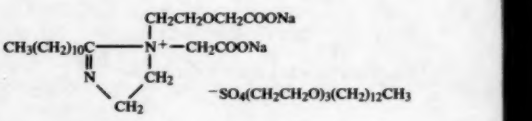
NON-STINGING EYE MAKE-UP REMOVER COMPOSITION

Timothy W. Quick, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Apr. 27, 1981, Ser. No. 258,184
Int. Cl.³ C11D 3/48, 1/18
U.S. Cl. 252—106 13 Claims

12. A non-stinging composition for removing make-up from the area near the eye comprising by weight, based on the total weight of the composition:

(1) 7.5 percent



(2) 1.5 percent polysorbate 20,
(3) 1.5 percent propylene glycol,
(4) 1.3 percent boric acid,
(5) 88.1 percent water,
(6) 0.01 percent chlorhexidine digluconate, and
(7) 0.05 percent phenethyl alcohol.

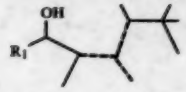
4,390,443

BRANCHED CHAIN OLEFINIC, ALCOHOLS, THIOLS, ESTERS AND ETHERS, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PREPARING SAME AND INTERMEDIATES THEREFOR

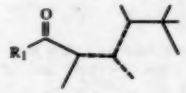
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 252,334, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Mar. 2, 1982, Ser. No. 354,388
Int. Cl.³ A61K 7/46; C11D 3/50, 9/44
U.S. Cl. 252—174.11 2 Claims

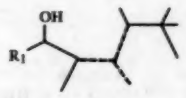
1. The process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_1 represents methyl or isopropyl and in each of the molecules of the mixture, one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds produced according to a process comprising the step of intimately admixing a ketone having the structure:

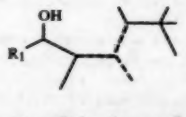


with a reducing agent selected from the group consisting of (i) an alkali metal borohydride; (ii) lithium aluminum hydride and (iii) aluminum isopropylate and then fractionally distilling the resulting reaction mixture whereby a composition of matter consisting essentially of a material having the strucjure:

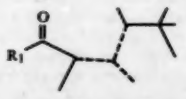


is produced.

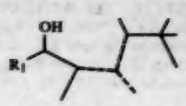
2. The process for augmenting or enhancing the aroma or taste of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of intimately admixing with a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base a composition of matter including more than one compound defined according to the structure:



wherein R_1 represents methyl or isopropyl and in each of the molecules of the mixture, one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds produced according to a process comprising the step of intimately admixing a ketone having the structure:



with a reducing agent selected from the group consisting of (i) an alkali metal borohydride; (ii) lithium aluminum hydride and (iii) aluminum isopropylate and then fractionally distilling the resulting reaction mixture whereby a composition of matter consisting essentially of a material having the structure:



is produced.

4,390,444

USE OF ISOMERIC MIXTURES OF FARNESENE FOR AUGMENTING OR ENHANCING THE AROMA OF DETERGENT COMPOSITIONS

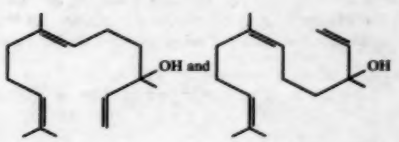
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown, both of N.J.; Bernard J. Chant, Rye, N.Y.; Anton V. Ouwerkerk, Livingston, N.J.; Venkatesh Kamath, Red Bank, N.J., and Cynthia J. Mussinan, Bricktown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 292,392, Aug. 13, 1981, Pat. No. 4,376,068. This application May 6, 1982, Ser. No. 375,532

Int. Cl.³ C11D 3/50

U.S. Cl. 252—174.11 **3 Claims**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base an aroma augmenting or enhancing quantity of a farnesene isomer mixture produced according to the process of dehydrating a nerolidol isomer mixture containing nerolidol isomers defined according to the structures:



in the presence of a catalyst selected from the group consisting of potassium acid sulfate and paratoluene sulfonic acid at a temperature in the range of from 110° C. up to 200° C. and at a pressure in the range of from 1 mm/Hg pressure up to 200 atmospheres pressure, absolute.

4,390,445

ALUMINIUM CHLORIDE COMPOSITION AND A METHOD FOR ITS MANUFACTURE

Ulla B. Gytel, Villa Linnea, Ramlösa Brunns Park S. 253 67, Helsingborg, Sweden

Filed Mar. 11, 1982, Ser. No. 357,179

Claims priority, application Sweden, Mar. 23, 1981, 8101829

Int. Cl.³ C02F 5/02, 5/08; C01F 7/56

U.S. Cl. 252—175 **8 Claims**

1. An aluminium-chloride composition for water-purifying, sludge-dewatering retention of fiber and filler in papermaking systems, and plant-dewatering purposes, comprising a clear, stable aqueous solution of aluminium chloride containing polynuclear complexes of the kind

$$Al_m(OH)_n^{(3m-n)+}$$

where m and n are positive integers, characterized in that said composition contains ions of alkali metal and/or alkaline earth metal in an amount which stoichiometrically substantially corresponds to the OH content of the solution; and that the total aluminium content is between about 0.3 and about 2 mole per liter.

4,390,446

SOLID STATE CELL WITH ANOLYTE

Laverne H. Barnette, Derry, N.H., and Charles C. Liang, Clarence, N.Y., assignors to Duracell Inc., Bethel, Conn.

Filed May 13, 1981, Ser. No. 262,890
Int. Cl.³ H01M 6/18, 4/40
U.S. Cl. 252—182.1 4 Claims

1. A method for increasing the high discharge rate capacity of a solid state cell having an active metal anode material, said method comprising the steps of admixing said active metal anode material with a solid cationic conductor, with said conductor comprising at least 50% by volume of said admixture and utilizing said admixture as the anode for said cell.

4,390,447

MANUFACTURING PROCESS FOR NICKEL (II) HYDROXIDE

August Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,031
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029898
Int. Cl.³ H01M 4/32
U.S. Cl. 252—182.1 8 Claims

1. A process for manufacturing nickel hydroxide for use as the active component of the positive electrode mass in alkaline electrochemical cells through reaction between a water soluble nickel(II) salt and alkali hydroxide, wherein

the nickel(II) salt in powder form is reacted directly into $Ni(OH)_2$ with highly concentrated hydroxide, while suppressing a homogeneous solute phase of the Ni^{2+} ions.

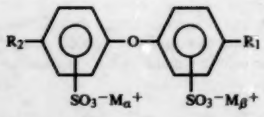
4,390,448

PERFUMED STABLE AQUEOUS HYPOCHLORITE BLEACH COMPOSITIONS CONTAINING 2-METHYL-2-OCTANOL AND THICKENED VARIATION THEREOF

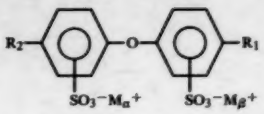
Richard M. Boden, Monmouth Beach; Michael Licciardello, Farmingdale; Joseph J. Maisano, Jr., Wanamassa, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,685
Int. Cl.³ C11D 7/54, 3/395, 3/50
U.S. Cl. 252—187.26 8 Claims

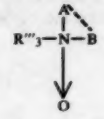
1. A perfumed aqueous alkali metal hypochlorite solution comprising as a sole detergent a composition of matter selected from the group consisting of (1) at least one substance defined according to the structure:



wherein at least one of R_1 and R_2 is C_{10}–C_{12} straight chain or branched chain alkyl; when one of R_1 or R_2 is C_{10}–C_{12} straight chain or branched chain alkyl the other of R_1 and R_2 is hydrogen; wherein M_α and M_β are the same or different and each represents alkali metal selected from the group consisting of sodium, potassium and lithium and (2) a mixture comprising a material having the structure:



and intimately admixed therewith a substance having the structure:



wherein R_3''' is straight chain alkyl; wherein more than 55% of the R_3''' moieties consist of straight chain alkyl having from 11 up to 13 carbon atoms and wherein "A" and "B" are each separately methyl up to 0.2% of one or more compatible perfume oils, said hypochlorite solution having a pH of 11 up to 14.0 and an aroma augmenting or enhancing quantity of 2-methyl-2-octanol.

4,390,449

METHOD OF PREPARING STOICHIOMETRIC ZINC SILICATE PHOSPHOR WITH IMPROVED BRIGHTNESS AND PERSISTENCE

Thomas E. Peters, Chelmsford, and James R. McColl, Concord, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 11, 1981, Ser. No. 357,013
Int. Cl.³ C09K 11/44
U.S. Cl. 252—301.6 F 5 Claims

1. A method of preparing a green-emitting substantially stoichiometric manganese and arsenic coactivated zinc silicate phosphor characterized by improved brightness and persistence comprising the steps of:

(a) forming a blend of zinc oxide, silicic acid, an oxide of arsenic, and a manganese compound thermally convertible to manganese oxide, wherein the amount of silicic acid present in said blend is between about 0.9 to 1 times the molar amount stoichiometrically required to react with the zinc oxide present in said blend to form Zn_2SiO_4,

(b) subjecting said blend to a first firing in air at a temperature of between about 650° C. and about 1000° C. for a period sufficient to form a pre-fired material including zinc silicate;

(c) adding to said pre-fired material an amount of ammonium chloride in excess of that required for complete reaction with any excess zinc oxide remaining in said pre-fired material subsequent to said first firing step, up to about 10 weight percent of said pre-fired mixture; and

(d) subjecting said pre-fired mixture containing ammonium chloride to a second firing step at a temperature between about 1000° C. and about 1300° C. for a period sufficient to remove said excess zinc oxide from said pre-fired material and to form a phosphor comprising substantially stoichiometric zinc silicate, said phosphor exhibiting a higher brightness than the corresponding phosphor prepared by said method and fired at a temperature greater than 1000° C. in the first firing step.

4,390,450

PROTEINACEOUS FOAMING COMPOSITIONS AND METHOD FOR PREPARING FOAMED PROTEINACEOUS PRODUCTS

Paul W. Gibson, Mt. Zion, and Frank T. Ortboefer, Decatur, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jul. 30, 1980, Ser. No. 174,307
Int. Cl.³ B01J 13/00
U.S. Cl. 252—307 11 Claims

1. A proteinaceous foaming composition consisting essentially of at least one proteinaceous foaming component selected from the group consisting of a vegetable seed protein hydrolyzate, egg albumen and casein hydrolyzate; in combination with water-soluble alkaline earth salt in an amount sufficient to provide an alkaline earth ionic concentration ranging from about 0.005 to about 0.5 mole for each mole nitrogen of said proteinaceous foaming component, and water-soluble zinc salt in an amount sufficient to provide an ionic concentration ranging from about 0.002 M to about 0.1 mole for each mole nitrogen of said protein component.

7. In an improved method for preparing foamed proteinaceous products from a protein foaming composition wherein an aqueous medium containing a proteinaceous foaming component is ingested with a sufficient amount of a gas to provide a foamed product, the improvement which comprises ingesting gas into an aqueous medium containing a proteinaceous foaming composition consisting essentially of at least one proteinaceous foaming component selected from the group consisting of vegetable protein hydrolyzate, egg albumen and casein hydrolyzate, at least 0.005 mole water-soluble alkaline earth metal salt for each mole nitrogen of said protein component and at least 0.002 M water-soluble zinc salt for each mole nitrogen of said protein component said proteinaceous foaming component being further characterized as being water-soluble at a pH above or below the isoelectric point of said proteinaceous foaming component when mixed with 20° C. water at 20% by weight dry solids concentration.

4,390,451

CONCENTRATED AQUEOUS METAL ALDONATE AND/OR AMMONIUM ALDONATE COMPOSITION

Reginoldus Havinga, Schalkhaar; Reinder Torenbeek, Le Twello, and Petrus H. M. Schreurs, Deventer, all of Netherlands, assignors to AKZO N.V., Arnhem, Netherlands

Filed Jun. 16, 1981, Ser. No. 274,250
Claims priority, application Netherlands, Jun. 30, 1980, 8003771
Int. Cl.³ B01J 13/00
U.S. Cl. 252—311 15 Claims

1. A concentrated aqueous composition, comprising
an aldonate of at least one member selected from the group consisting of a metal aldonate and an ammonium aldonate, part of said aldonate being present in a dissolved state and part of said aldonate being present in a suspended state; and
a colloidal gum suspending agent.

4,390,452

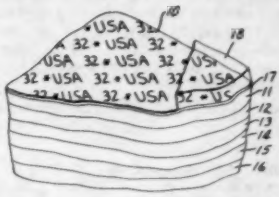
MICROPARTICLES WITH VISUAL IDENTIFYING MEANS

Edward J. Stevens, Lake Elmo, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1979, Ser. No. 67,931
Int. Cl.³ G01N 33/22; B32B 3/00; C09K 3/00; C09F 3/02
U.S. Cl. 252—408.1 20 Claims

1. In a batch of organic microparticles which are uniformly encoded for retrospective identification, each of the same thickness not significantly exceeding 500 micrometers and having two surfaces which are generally flat and parallel to each other across its broadest dimension, the broadest dimension of most of the microparticles being no greater than 1000 micrometers but greater than said thickness, the improvement comprising:
at least one of the flat surfaces of each microparticle bears identifying indicia selected from alphanumerics and symbols which provide a repetitive code that (a) is randomly located with respect to the edges of the microparticle, (b) can be visually interpreted under magnification, and (c) repeats in any direction within a distance less than said broadest dimension so that examination of a typical microparticle of average size should reveal said code.

12. Method of making a batch of microparticles useful for retrospective identification comprising the steps of:
(1) making an organic sheet of substantially uniform thickness not significantly exceeding 500 micrometers,



(2) forming on at least one face of the sheet identifying indicia selected from alphanumerics and symbols which provide a repetitive code that can be visually interpreted under magnification and repeats in any direction within a distance not significantly exceeding 500 micrometers, and
(3) comminuting the sheet at random into a batch of microparticles, each having two surfaces which are generally flat and parallel to each other and contain portions of said indicia, the broadest dimension of most of the microparticles being no greater than 1000 micrometers, but greater than said distance so that examination of a typical microparticle of average size should reveal said code.

17. Method of tagging a substance for retrospective identification comprising incorporating with a substance a plurality of microparticles from a batch as defined in claim 1.

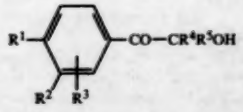
4,390,453

MIXTURES OF AROMATIC-ALIPHATIC KETONES AS PHOTOINITIATORS AND PHOTOPOLYMERIZABLE SYSTEMS CONTAINING THEM

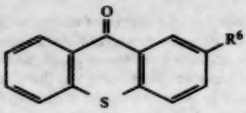
Jürgen Eichler, Weiterstadt; Claus Herz, Heidelberg, and Karl-Heinz Neisius, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 243,119
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010148
Int. Cl.³ B01J 31/02
U.S. Cl. 252—426 5 Claims

1. A composition comprising
(A) 0.1 to 99.9 weight % of at least one hydroxyalkylphenone of the formula



wherein R^1 is H, alkyl of 1–4 C atoms or chlorine, R^2 is H or methyl, R^3 is H or methyl, R^4 is alkyl of 1–6 C atoms and R^5 is alkyl of 1–6 C atoms, and
(B) 99.9 to 0.1 weight % of at least one 2-alkylthioxanthone of the formula



wherein R^6 is alkyl of 1–8 C atoms.

4,390,454

CATALYST COMPONENTS FOR POLYMERIZING OLEFINS

Illaro Cuffiani; Paolo Galli, and Umberto Zucchini, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 23, 1981, Ser. No. 285,961
Claims priority, application Italy, Jul. 24, 1980, 23656 A/80
Int. Cl.³ C08F 4/64
U.S. Cl. 252—429 B 8 Claims

1. Components of catalysts for the polymerization of olefins, comprising the product which is obtained by reacting the reaction product between:

(A) a magnesium compound selected from

(1) compounds of formula $X_nMg(OR)_{2-n}$ wherein X is Cl or Br, a group —OH, an alkyl, an aryl or a cycloalkyl having 1 to 20 carbon atoms; R is an alkyl, an aryl or a cycloalkyl having 1 to 20 carbon atoms, or a group —COR′ in which R′ is a hydrocarbon radical as specified for R; $0 \leqq n \leqq 2$;

(2) MgO, $Mg(OH)_2$, XMgOH, in which X is Cl or Br; and

(B) a compound of titanium, vanadium or zirconium having at least two metal-oxygen bonds of the type Ti-OR, V-OR, or Zr-OR, in which R is an alkyl, an aryl or a cycloalkyl having 1 to 20 carbon atoms or the group

with

(C) a halogenated compound of a transition metal of Groups IV, V, VI of the Periodic System of formula MO_mX_n in which M is a transition metal, X is Cl or Br, $m \geqq 0$, $n > 0$, 2 m+n being equal to the valence of metal M.

4. Catalyst components according to claim 1, consisting of the product obtained by reacting the product of the reaction between compounds (A) and (B) with a silicium compound having a halogenating and/or reducing action and then with compound (C).

4,390,455

CATALYTIC MEMBRANES IN ARTIFICIAL ORGANS

Werner Henne, and Jürgen Scheuren, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Dec. 14, 1981, Ser. No. 330,772
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048542
Int. Cl.³ B01J 31/06
U.S. Cl. 252—430 2 Claims

1. In a method for the production of membranes for artificial organs in the form of tube foils, flat foils or hollow filaments into which metals and/or metal compounds are incorporated, by introducing a metal salt solution into the membrane composed of a polymer, and then attacking the membrane with gaseous precipitating agent, and bringing it to reaction for precipitation, the improvement comprising having the introduction of the metal salt solution and the attack with gas take place in a membrane-containing module for an artificial organ.

4,390,456

SPHEROIDAL ALUMINA PARTICLES AND CATALYSTS EMPLOYING THE PARTICLES AS A SUPPORT

Moises G. Sanchez, Severna Park; Michael V. Ernest, Baltimore, and Norman R. Laine, Rockville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 64,700, Aug. 8, 1979, Pat. No. 4,279,779, which is a continuation of Ser. No. 781,379, Mar. 25, 1977, Pat. No. 4,179,408. This application Jul. 17, 1981, Ser. No. 284,317
The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.
Int. Cl.³ B01J 21/04, 23/42, 23/44, 23/46
U.S. Cl. 252—448 20 Claims

1. A catalyst support comprising spheroidal alumina particles having a total pore volume of about 0.8 to about 1.7 cubic centimeters per gram, a pore volume of about 0.5 to about 1.0 cubic centimeters per gram in pores of 100 to 1000 Å. in diameter, a pore volume of about 0.1 to about 0.4 cubic centimeters per gram in pores of 1000 to 10,000 Å. in diameter, an attrition loss of less than about 5%, and a compacted bulk density of about 20 to about 36 pounds per cubic foot.

4,390,457

SYNTHESIS OF MOLECULAR SIEVES USING 2-AMINOPYRIDINE AS A TEMPLATE

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 28, 1981, Ser. No. 305,976
Int. Cl.³ C01B 33/28; B01J 29/06
U.S. Cl. 252—455 Z 25 Claims

1. A method to prepare a crystalline aluminosilicate molecular sieve comprising (1) forming an aqueous mixture of an oxide of aluminum, an oxide of silicon, a cation and 2-aminopyridine as an organic template compound, (2) maintaining the pH of such mixture between about 9 and about 13.5 and (3) crystallizing such mixture.

4,390,458

ELECTRICALLY CONDUCTIVE ARTICLES

James P. McKaveney, Claremont, Calif., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 871,730, Jan. 23, 1978, Pat. No. 4,197,218, which is a continuation-in-part of Ser. No. 853,653, Nov. 21, 1977, abandoned. This application Feb. 28, 1980, Ser. No. 125,715
Int. Cl.³ H01B 1/04
U.S. Cl. 252—503 16 Claims

1. An electrically conductive article comprised of a matrix of a non-conductive material containing a substantially uniform dispersion of a finely divided conductive material selected from the group consisting of ferromanganese, ferromolybdenum, ferrosilicon, ferrochrome, ferrovanadium, ferrozirconium, ferrotitanium, ferrotungsten, iron carbide, and mixtures thereof.

4,390,459

CONDUCTIVE MOLDING COMPOSITIONS COMPRISING VINYL CHLORIDE-VINYL ETHER COPOLYMERS

Marvin Koral, Warren, and Donald Goodman, Flemington, both of N.J., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Sep. 2, 1981, Ser. No. 298,832
Int. Cl.³ H01B 1/06
U.S. Cl. 252—511 10 Claims

1. In a conductive molding composition that comprises a vinyl halide resin, sufficient finely-divided conductive carbon black particles that the composition has a bulk resistivity below 500 ohm—cm. at 900 megahertz, a stabilizer component, a lubricant component, and a plasticizer and processing aid component, the improvement wherein the vinyl halide resin is

a vinyl chloride-vinyl ether copolymer containing from 0.1% to 5% by weight of a vinyl ether having the structural formula

$$CH_2{=}CHOR$$

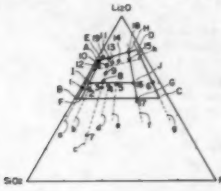
wherein R represents an alkyl, haloalkyl, aryl, or haloaryl radical having 1 to 18 carbon atoms.

4,390,460

LITHIUM OXIDE BASED AMORPHOUS MATERIAL AND PROCESS FOR PREPARATION THEREOF

Katsuki Miyauchi, Hino; Tetsu Oi, Tokyo, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,600
Claims priority, application Japan, Sep. 29, 1980, 55-134436
Int. Cl.³ H01B 1/06
U.S. Cl. 252—518 9 Claims



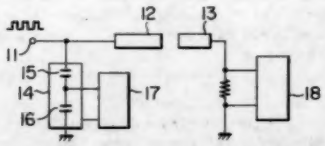
1. A lithium oxide based amorphous material which has a thickness of 0.1 to 50 μm and which has a composition included in a region defined by lines connecting points A, B, C and D to one another in a composition diagram of the ternary system of Li_2O-SiO_2-P_2O_5shown in FIG. 1 of the accompanying drawings.

4,390,461

FERRITE ELECTRODE MATERIAL

Nobuyoshi Tsukiyama, and Ryo Ichige, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,666
Claims priority, application Japan, Apr. 4, 1980, 55-43477
Int. Cl.³ H01B 1/06
U.S. Cl. 252—519 10 Claims



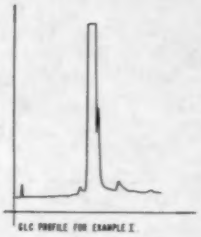
1. A ferrite electrode material consisting essentially of a calcined mixture of metal oxides of the formulation $(BaO)_n$·$(Fe_2O_3)_m$ or $(BaO)_n$·$(FeO.Fe_2O_3)_m$, wherein n is 0.6 to 1.0 and m is 0.8 to 1.2 in molar ratio.

4,390,462

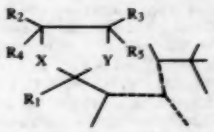
ALIPHATIC BRANCHED OLEFIN DIOXOLANES, DITHIOLANES, AND OXATHIOLANES AND USES THEREOF IN AUGMENTING OR ENHANCING THE AROMA AND/OR TASTE OF CONSUMABLE MATERIALS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 212,993, Dec. 4, 1980, Pat. No. 4,315,952. This application Nov. 19, 1981, Ser. No. 322,726
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R 5 Claims



1. A process for augmenting or enhancing the aroma of a perfume composition or a cologne comprising the ste of adding to a perfume base or a cologne base an aroma augmenting or enhancing quantity of at least one dioxolane, oxathiolane or dithiolane compound defined according to the structure:



wherein R_1 represents C_1–C_4 lower alkyl; R_2, R_3, R_4 and R_5 represent hydrogen or C_1–C_3 lower alkyl; X and Y are the same or different and each represents oxygen or sulfur and wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds.

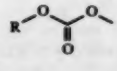
4,390,463

PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF PERFUME COMPOSITIONS AND COLOGNES UTILIZING ALKYL, ARALKYL, AND BICYCLOALKYL METHYL CARBONATES

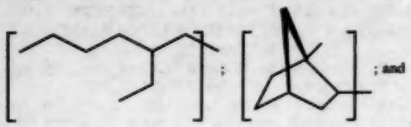
Richard M. Boden, Monmouth Beach; Michael Licciardello, Farmingdale, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,872
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 4 Claims

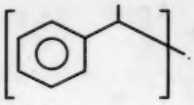
1. A process for augmenting or enhancing the aroma of a perfume composition or a cologne comprising the step of intimately admixing with a perfume composition base or a cologne base an aroma augmenting or enhancing quantity of at least one methyl carbonate derivative defined according to the structure:



wherein R is a moiety selected from the group of moieties having the structures:



; and



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4,390,464

METHYL SUBSTITUTED NORBORNANE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

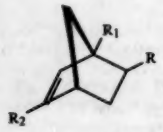
Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 284,108, Jul. 16, 1981, Pat. No. 4,346,243, which is a continuation-in-part of Ser. No. 247,323, Mar. 25, 1981, Pat. No. 4,326,998, which is a continuation-in-part of Ser. No. 152,187, May 22, 1980, Pat. No. 4,284,824. This application Apr. 6, 1982, Ser. No. 366,091

Int. Cl.[3] A61K *7/46;* C11B *9/00*

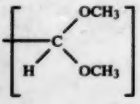
U.S. Cl. 252—522 R 1 Claim

1. The process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to a perfume base or a cologne base at lease one compound defined according to the structure:



wherein R represents the nitrile moiety having the structure:

or the dimethoxymethyl moiety having the structure:



and wherein one of R_1, or R_2 is methyl and the other of R_1 or R_2 is hydrogen.

4,390,465

LOW TEMPERATURE COMPOSITION FOR PLATING PRETREATMENT OF FERROUS METALS

Paul Spekman, Jr., Bloomington, Minn., assignor to Fremont Industries, Inc., Shakopee, Minn.

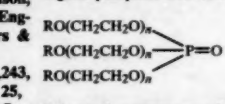
Filed Jun. 22, 1981, Ser. No. 275,800

Int. Cl.[3] C11D *1/825;* C23G *1/14*

U.S. Cl. 252—527 3 Claims

1. A formulation for the treatment of the surfaces of ferrous metal parts having the following formulation:

Composition	Percent by Weight
(A) An alkaline builder including, in the composite, sodium hydroxide, sodium metasilicate, and sodium carbonate wherein the components are present as follows:	
Sodium hydroxide	15–30
Sodium metasilicate	10–30
Sodium carbonate	10–30
(B) A water conditioner including, in the composite, sodium tripolyphosphate and tetrasodium ethylenediaminetetraacetate in the concentrations:	
Sodium tripolyphosphate (determined as anhydrous)	10–15
Tetrasodium ethylene-diaminetetraacetate (determined as the tetrahydrate)	1–5
Alpha-sodium glucoheptonate (determined as the dihydrate)	5–15
(C) A surfactant, including, in the composite, the sodium salt of petroleum sulfonic acid (petroleum sulfonate)	1–10
Linear ethoxylated alcohol organic phosphate ester complex	1–10



Wherein R represents an alkyl group containing from between 8 and 10 carbon atoms and wherein "n" is an integer ranging from 1 to 6.

And a modified straight chain aliphatic polyether having the structural formula as follows:	1–10
$R—O(CH_2CH_2O)_nCH_2CH_2R^1$	
R—alkyl	
R^1—a hydrophobic group	
(D) Hexylene glycol	1–10

4,390,466

HEAVY DUTY LIQUID DETERGENT

Harold Weinberger, 309 Johnson Ave., Teaneck, N.J. 07666

Filed Apr. 30, 1981, Ser. No. 258,887

Int. Cl.[3] C11D *3/32, 3/43, 1/70*

U.S. Cl. 252—548 24 Claims

1. An aqueous liquid detergent composition with improved penetrating, dissolving and suspending characteristics comprising about 2 to 8% by weight, 70% active, of a lower alkanolacetamide and about 2 to 5% by weight of a liquid isoparaffinic hydrocarbon.

4,390,467

LIQUID CRYSTAL COMPOSITIONS

Yutaka Mizukuchi, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,433

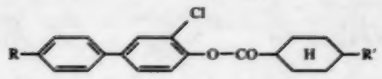
Claims priority, application Japan, Apr. 30, 1981, 56-65616

Int. Cl.[3] C09K *3/34;* C02F *1/13*

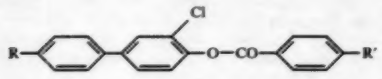
U.S. Cl. 252—299.63 9 Claims

1. A liquid crystal composition comprising at least two

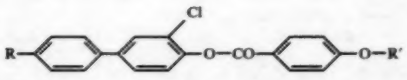
compounds selected from the group I consisting of trans-4-alkylcyclohexane-1-carboxylic acid-4'-(4''-alkylphenyl)-2'-chlorophenyl ester having the general formula:



wherein R and R' are normal chain alkyl groups containing 2 to 7 carbon atoms, said at least two compounds making up 30 mole % or more of the total composition, and at least one compound selected from at least one of the group II consisting of 4-alkylbenzoic acid-4'-(4''-alkylphenyl)-2'-chlorophenyl ester having the general formula:



wherein R and R' are normal chain alkyl groups containing 2 to 8 carbon atoms and the group III consisting of 4-alkoxybenzoic acid-4'-(4''-alkylphenyl)-2'-chlorophenyl ester having the general formula:



wherein R and R' are normal chain alkyl groups containing 2 to 8 carbon atoms.

4,390,468

PREPARATION OF ANTITUMOR AGENT FROM SHELLFISH

Takuma Sasaki, Tokyo, and Kazuya Nakamichi, Sohka, both of Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Aug. 4, 1982, Ser. No. 404,971
Int. Cl.³ A23J 1/04; C07G 7/00
U.S. Cl. 260—112 R **10 Claims**

1. A process for the preparation of an antitumor agent consisting essentially of water-soluble, macromolecular glycoprotein substances having a range of molecular weights within the limits of from 10,000 to 300,000 from shellfish which comprises recovering the liquid portion which comes from cooking of raw shellfish in a hot aqueous solvent or with vapor of such solvent and which is to be discarded as waste, concentrating the liquid portion thus recovered to a smaller volume or to dryness to yield a concentrate or dry powder and isolating the water-soluble, macromolecular glycoprotein substances from the concentrate or dry powder.

10. An antitumor agent having no cytotoxicity but an immunopotentiating activity and consisting essentially of water-soluble, macromolecular glycoprotein substances which are recovered from the liquid portion which comes from cooking of shellfish with a hot aqueous solvent or with the vapor of such solvent and which have the following characteristics:

(1) Molecular weight: About 10,000 to about 300,000 as measured by gel-filtration chromatography,
(2) Ultraviolet absorption spectrum: With a characteristic absorption peak $\lambda_{max}^{H_2O}$ at 278 nm,
(3) Infrared absorption spectrum (pelleted in KBr): With characteristic absorption peaks at 3500~3300, 1650, 1540 and 1400 cm^{-1},
(4) Solubility: Soluble easily in water but insoluble in organic solvents such as methanol, ethanol and acetone,
(5) Color reactions: Positive in biuret reaction, xanthoproteic reaction, phenolic reagent reaction, anthrone-sulfuric acid reaction and phenol-sulfuric acid reaction; but pseudo-positive in cysteine-sulfuric acid reaction,
(6) Acidic or basic nature: Amphoteric electrolyte,
(7) Substance color and appearance: White-colored solid with or without faint brown tinge,
(8) Amino acids in hydrolysate: When hydrolyzed in 6 N HCl at 105°~110° C. for 24 hours, the resulting hydrolysate contains at least the following amino acids: aspartic acid, hydroproline, threonine, serine, glutamic acid, proline, glycine, alanine, cysteine, valine, methionine, isoleucine, leucine, tyrosine, phenylalanine, lysine, arginine, histidine, hydroxylysine,
(9) Carbohydrates in hydrolysate: When hydrolyzed in 2 N HCl at 80°~90° C. for 10 hours, followed by the removal of the amino acids from the hydrolysate by ion-exchange chromatography and further by hydrogenation of the amino acids-free hydrolysate, the hydrogenated hydrolysate contains at least the following carbohydrates: fructose, mannose, fucose, inositol, galactose.

4,390,469

CONTROL OF RESIDUAL SOLVENT IN OAT PRODUCTS

Richard W. Oughton, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Apr. 28, 1981, Ser. No. 258,384
Claims priority, application Canada, May 15, 1980, 352012
Int. Cl.³ A23J 1/12
U.S. Cl. 260—123.5 **11 Claims**

1. An improvement in the process for control of the amount of residual solvent in proteinaceous material selected from the group consisting of comminuted oats and matter derived therefrom, wherein the proteinaceous material is admixed with a hydrocarbon solvent selected from the group consisting of pentane, hexane, heptane and cyclohexane, and mixtures thereof, and at least a fraction of the proteinaceous material is separated from the solvent and treated for removal of residual solvent, the improvement comprising:

(a) maintaining the temperature of the mixture of proteinaceous material and solvent in the range of 0°–35° C.; and
(b) controlling the period of time of contact of solvent and proteinaceous material to less than 120 minutes, and the period of time of treatment for removal of residual solvent to a range of 5 to 500 minutes, whereby separation of a product having a level of residual solvent of less than 60 ppm may be effected.

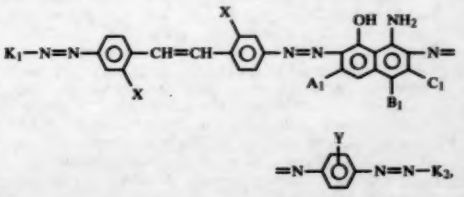
4,390,470

TETRAKISAZO DYES CONTAINING A STILBENYLENE OR 2,2'-DISULFOSTILBENYLENE RADICAL

Heinz Wicki, Basel, Switzerland, and Claude Vogel, St. Louis, France, assignors to Sandoz Ltd., Basel, Switzerland

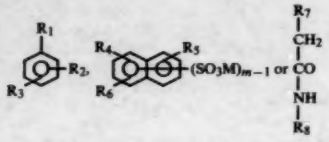
Division of Ser. No. 885,627, Mar. 13, 1978, Pat. No. 4,169,832, which is a continuation-in-part of Ser. No. 717,522, Aug. 25, 1976, abandoned. This application May 16, 1979, Ser. No. 39,254
Claims priority, application Switzerland, Sep. 5, 1975, 11590/75
Int. Cl.³ C09B 31/30, 33/18
U.S. Cl. 260—166 **11 Claims**

1. A compound of the formula

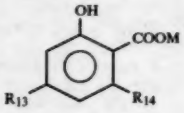


wherein each of A_1, B_1 and C_1 is independently hydrogen or $-SO_3M$, with the proviso that when A_1 is $-SO_3M$, one of B_1

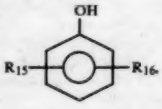
and C_1 is $—SO_3M$ and the other is hydrogen and when A_1 is hydrogen, B_1 is $—SO_3M$ and C_1 is hydrogen, each of K_1 and K_2 is independently the radical of a coupling component of the formula



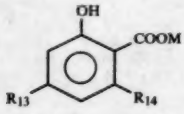
or the radical of a coupling component (fg), said coupling component (fg) being the product of the condensation, under acid conditions, of formaldehyde and (a) a compound of the formula



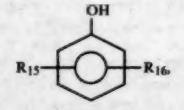
or a mixture of such compounds, (b) a compound of the formula



or a mixture of such compounds, or (c) a mixture of at least one compound of the formula



and at least one compound of the formula



with the provisos that the mol ratio of formaldehyde to the other compound(s) is at least 0.5:1 and that at least 50 mol % of the other compound(s) contain a —COOM group, wherein

R_1 is hydroxy, $—NH_2$, C_{1-4}alkylamino, di-(C_{1-4}alkyl)amino, C_{2-4}hydroxyalkylamino, di-(C_{2-4}hydroxyalkyl)amino, N-C_{1-4}alkyl-N-C_{2-4}hydroxyalkylamino, $—NHCH_2SO_3M$, arylamino, N-C_{1-4}alkyl-N-arylamino or N-C_{2-4}hydroxyalkyl-N-arylamino, wherein any aryl is phenyl; naphthyl; substituted phenyl having 1 to 3 substituents each of which is independently C_{1-4}alkyl, C_{1-4}alkoxy (not more than two), nitro (not more than two), chloro (not more than two), —COOM (not more than one) or $—SO_3M$ (not more than one); or naphthyl substituted by 1 or 2 $—SO_3M$ groups, with the proviso that the hydroxy group of any C_{2-4}hydroxyalkyl moiety is not on the α-carbon atom,

R_2 is hydrogen, hydroxy, $—NH_2$, C_{1-4}alkyl, C_{1-4}alkoxy, chloro or acylamino,

R_3 is hydrogen, C_{1-4}alkyl, $—SO_3M$ or —COOM,

R_4 is hydroxy, $—NH_2$, phenylamino or (substituted phenyl)amino wherein substituted phenyl has 1 to 3 substituents each of which is independently C_{1-4}alkyl or C_{1-4}alkoxy (not more than two),

R_5 is hydrogen, hydroxy, $—NH_2$, $—NHCH_2SO_3M$ or acylamino,

R_6 is hydrogen, C_{1-4}alkoxy or —COOM, with the proviso that R_6 must be hydrogen or C_{1-4}alkoxy when m is 2 or 3,

R_7 is acyl,

R_8 is phenyl; naphthyl; substituted phenyl having 1 to 3 substituents each of which is independently C_{1-4}alkyl, C_{1-4}alkoxy (not more than two), chloro (not more than two), acetyl (not more than one) or $—SO_3M$ (not more than one); or naphthyl substituted by 1 or 2 $—SO_3M$ groups,

each of R_{13}, R_{14}, R_{15} and R_{16} is independently hydrogen; fluoro; chloro; bromo; iodo; hydroxy; C_{1-4}alkyl; C_{1-4}alkyl substituted by fluoro, chloro, bromo, iodo, —COOM, cyano, hydroxy, C_{1-4}alkoxy or C_{1-4}hydroxyalkoxy; C_{1-4}alkoxy or C_{1-4}alkoxy substituted by fluoro, chloro, bromo, iodo, —COOM, cyano, hydroxy, C_{1-4}alkoxy or C_{1-4}hydroxyalkoxy, and

m is 1, 2 or 3, wherein each acyl and acyl moiety of acylamino is independently phenylsulfonyl, tolylsulfonyl, benzoyl, (C_{1-4}alkyl)carbonyl or acetoacetyl, with the proviso that at least one of K_1 and K_2 is the radical of a coupling component (fg),

each X is hydrogen or $—SO_3M$, with the proviso that the two X's are the same,

Y is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy, fluoro, chloro, bromo, —COOM or $—SO_3M$, and

each M is hydrogen or a non-chromophoric cation.

4,390,471

IMIDAZODIAZEPINES AND PROCESSES THEREFOR

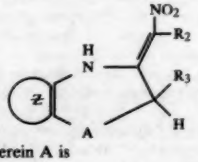
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 243,162

Int. Cl.³ C07D *487/22, 487/04;* A61K *31/55*

U.S. Cl. 260—244.4 **1 Claim**

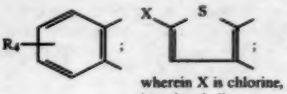
1. A compound of the formula



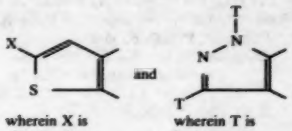
wherein A is

and R_3 is selected from the group consisting of hydrogen or lower alkyl; R_2 is selected from the group consisting of hydrogen or lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, C_1 to C_7 lower alkyl, phenyl, chlorophenyl or tolyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl; and

is selected from the group consisting of



wherein X is chlorine, bromine, iodine or hydrogen



wherein X is chlorine, bromine, iodine or hydrogen

and

wherein T is hydrogen or lower alkyl

4,390,472

PROCESS FOR THE OXIDATION OF HYDROCARBONS

Jacques D. V. Hanotier; Monique J. S. Bridoux, both of Lasne-Chapelle-Saint-Lambert, and Jacques F. Dauby, Groot-Bijgaarden, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Apr. 22, 1981, Ser. No. 256,255

Claims priority, application Luxembourg, Apr. 29, 1980, 82414

Int. Cl.³ C07C *53/00*; C04B *9/02*

U.S. Cl. 260—398.6 9 Claims

1. Process for the partial oxidation of hydrocarbons, more particularly of petrolatum or other material having a high content in microcrystalline waxes with formation of acid products, which comprises introducing a molecular oxygen-containing gas into melted petrolatum in the presence of an oxidation catalyst and in the presence of liquid water in an amount which is maintained between about 1% to about 25% based on the weight of petrolatum during the oxidation reaction.

4,390,473

RECOVERY OF RHODIUM AND COBALT LOW PRESSURE OXO CATALYST

James L. Cooper, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 276,389, Jun. 22, 1981, abandoned. This application Jun. 21, 1982, Ser. No. 390,493

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R 7 Claims

1. A process for recovering rhodium and cobalt from an oxo catalyst solution containing ligandized (modified) rhodium and cobalt in a molar ratio of Rh/Co of 5/1 to 1/50, and a molar ratio of (Rh+Co)/Ligand of from about 1/1 to 1/500, organic solvent, and at least trace amounts of oxo aldehyde, which comprises contacting said catalyst solution with an oxygen containing gas in an O_2/Rh molar ratio from about 1/1 to about 10,000/1, and with sufficient aqueous formic acid to convert the rhodium and cobalt to stable formates and to form an organic phase and an aqueous phase, wherein the rhodium and cobalt formates are solubilized in said aqueous phase, and thereafter separating said phases.

4,390,474

SULFONATION PETROLEUM COMPOSITION

Marvin L. Nussbaum, Skokie, and Edward A. Knaggs, Deerfield, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.

Continuation of Ser. No. 886,344, Mar. 13, 1978, abandoned, which is a division of Ser. No. 676,470, Apr. 13, 1976, Pat. No. 4,148,821, which is a continuation-in-part of Ser. No. 515,013, Oct. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,439, Jan. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 9,065, Feb. 5, 1970, abandoned. This application Jun. 12, 1980, Ser. No. 158,985

Int. Cl.³ C07C *143/24*; C09K *3/00*

U.S. Cl. 260—505 R 42 Claims

1. A sulfonated petroleum composition which is substantially homogeneous under reaction conditions utilized to produce said composition, and comprising on a 100 organic weight percent total weight basis

(A) from about 5 to 98 weight percent of monosulfonated hydrocarbon,

(B) from about 0 to 50 weight percent of polysulfonated hydrocarbon, and

(C) from about 2 to 90 weight percent of non-sulfonated petroleum,

said composition having been prepared by contacting a liquid hydrocarbon mixture with a gaseous sulfur trioxide composition at a temperature of from about 77° to 392° F., said hydrocarbon mixture comprising initially on a 100 weight percent total weight basis

(A) from about 85 to 99.5 weight percent of a petroleum oil feed stock, and

(B) from about 0.5 to 15 weight percent of an additive, said petroleum oil feed stock being characterized by

(a_1) having an API gravity ranging from about 5° to 60° at 60° F.,

(a_2) having a boiling point (corrected atmospheric) ranging from about −20° to 1400° F., and

(a_3) containing from about 10 to 95 weight percent (100 weight percent total basis) sulfonatable components,

said additive being characterized by

(b_1) being comprised of unsulfonatable organic radical portions possessing an average molecular weight range from about 55 to 6000,

(b_2) having a boiling point in the range from about 212° to 932° F. corrected atmospheric, and

(b_3) a preponderance of such radicals each having attached at least one proton replaceable by a sulfo group and at least one moiety selected from the group consisting of an aromatic nucleus, an olefinic carbon pair, and an oxygen atom directly bonded to a carbon atom by at least one bond.

4,390,475

THIN FILM TYPE SULFONATION PROCESS OF ALKYLBENZENE

Fusao Kondo; Toshimi Terao, both of Chiba; Katsumasa Nagano, Ichikawa, and Kyozo Kitano, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 163,162, Jun. 26, 1980. This application Sep. 28, 1981, Ser. No. 306,504

Claims priority, application Japan, Jul. 6, 1979, 54-86252

Int. Cl.³ C07C *143/24*

U.S. Cl. 260—505 S 6 Claims

1. In a process for effecting the thin film sulfonation of alkylbenzene containing small amounts of olefins as impurities, in which a feed stream of the alkylbenzene is flowed downward in the form of a thin film along a surface of a reaction wall of a sulfonation reactor and is contacted with a gaseous stream of sulfur trioxide diluted with inert gas, the improvement wherein:

2 through 20 parts by weight, based on 100 parts by weight of said alkylbenzene, of at least one member selected from the group consisting of alkylbenzene sulfonic acids having

alkyl groups of 1 through 20 carbon atoms and benzenesulfonic acid are added to the alkylbenzene prior to the contact thereof with the diluted gaseous sulfur trioxide, whereby the presence of said at least one of said alkylbenzene sulfonic acids and said benzene sulfonic acid substantially prevents the formation of deposits on the surface of the reaction wall.

4,390,476

PHOSPHONIUM COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND A PROCESS FOR THE PREPARATION OF ASYMMETRICALLY SUBSTITUTED STILBENE FLUORESCENT BRIGHTENING AGENTS

Michael Märky, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 150,026, May 15, 1980, Pat. No. 4,316,860, which is a division of Ser. No. 950,902, Oct. 12, 1978, Pat. No. 4,231,957. This application Nov. 5, 1981, Ser. No. 318,647

Int. Cl.³ C07C *145/00, 143/38, 63/36*

U.S. Cl. 260—505 C **13 Claims**

1. A process for the preparation of a phosphonium compound of the formula

$$(R)_3P^{\oplus}—CH_2—X'CH=CH—R_1—Y^{\ominus}$$

in which R is alkyl having 1 to 6 C atoms, cycloalkyl having 5 to 7 C atoms, aryl or the group $—NX_1X_2$, in which X_1 and X_2 independently of one another are alkyl having 1 to 4 C atoms or together with the N atom are a 5-membered or 6-membered saturated heterocyclic ring, R_1 is a mononuclear or binuclear aromatic or hetero-aromatic radical, which can contain further non-chromophoric substituents, X is phenylene, 4,4'-biphenylene or 1,4- or 2,6-naphthylene and $Y^{\ominus}$ is $SO_3^{\ominus}$, $SO_2^{\ominus}$ or $COO^{\ominus}$, which comprises reacting a phosphonium compound of the formula

$$(R)_3P^{\oplus}—CH_2—X—CH_2—P^{\oplus}(R)_3$$
$$Q^{\ominus} \qquad\qquad Q^{\ominus}$$

in which R and X are as defined above and $Q^{\ominus}$ is an anion, in the presence of a strongly basic compound and of a polar solvent with an aldehyde of the formula

$$M^{\oplus}Y^{\ominus}—R_1—CHO$$

in which R_1 and $Y^{\ominus}$ are as defined above and $M^{\oplus}$ is a cation.

7. A process for the preparation of an asymmetrical fluorescent brightening agent of the formula

$$Z—CH=CH—X—CH=CH—R_1—Y^{\ominus}M^{\oplus}$$

in which R_1 is a mononuclear or binuclear aromatic carbocyclic or heterocyclic radical which can contain further non-chromophoric substituents, X is phenylene, 4,4'-biphenylene or 1,4- or 2,6-naphthylene, Z is a mononuclear or binuclear aromatic carbocyclic or heterocyclic radical which can be substituted by non-chromophoric substituents, Z differing from the group $—R_1—Y^{\ominus}M^{\oplus}$, $Y^{\ominus}$ is $SO_3^{\ominus}$, $SO_2^{\ominus}$ or $COO^{\ominus}$ and $M^{\oplus}$ is a cation, which comprises reacting a phosphonium compound of the formula

$$(R)_3P^{\oplus}—CH_2—X—CH_2—P^{\oplus}(R)_3$$
$$Q^{\ominus} \qquad\qquad Q^{\ominus}$$

in which X is as defined above, R is alkyl having 1 to 6 C atoms, cycloalkyl having 5 to 7 C atoms, aryl or the group $—NX_1X_2$, in which X_1 and X_2 independently of one another are alkyl having 1 to 4 C atoms or together with the N atom are a 5-membered or 6-membered saturated heterocyclic ring, and $Q^{\ominus}$ is an anion, in the presence of a strongly basic compound in a polar solvent with an aldehyde of the formula

$$M^{\oplus}Y^{\ominus}—R_1—CHO$$

in which R_1, $Y^{\ominus}$ and $M^{\oplus}$ are as defined above, at temperatures between 20° and 150° C. and reacting the resulting reaction product of the formula

$$(R)_3P^{\oplus}—CH_2—X—CH=CH—R_1—Y^{\ominus}$$

after this has been isolated or directly in the reaction mixture, with an aldehyde of the formula Z—CHO at temperatures of 100° to 200° C. in the presence of a strongly basic compound in a polar solvent which boils above 100° C.

4,390,477

DIPHENYL PENTAERYTHRITOL DIPHOSPHONATE

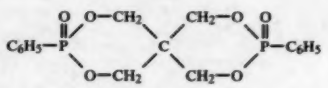
Robert J. Axelrod, Glenmont, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 831,056, Sep. 6, 1977, abandoned. This application Jun. 11, 1982, Ser. No. 387,500

Int. Cl.³ C08K *5/53;* **C08F** *9/79*

U.S. Cl. 260—927 R **1 Claim**

1. A compound of the formula



4,390,478

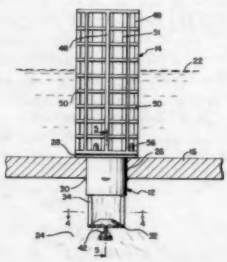
SPRAYING APPARATUS FOR WATER COOLING TOWER

Charles E. Sheperd, Houston, Tex., assignor to C. E. Shepherd Company, Inc., Houston, Tex.

Filed May 12, 1981, Ser. No. 262,990

Int. Cl.³ B01D *47/08*

U.S. Cl. 261—6 **12 Claims**



1. In a cooling tower having fill elements and a substantially flat wet deck positioned above said elements, a plurality of spray assemblies extending through said wet deck over said fill elements, each spray assembly comprising:

a nozzle having a vertically oriented hollow body passing through said wet deck and having a vertical hole passing therethrough;

a dispersion plate positioned below said hole and said wet deck at a position spaced from said body for dispersing liquid passing through said hole;

an aperture formed in said dispersion plate below said hole;

a secondary dispersion surface disposed below said aperture for disrupting a flow of liquid passing through said aperture;

a generally vertical filter screen having an encircling grid-like side wall, a top wall construction and an open bottom, and said grid-like side wall having openings of a sufficient

size to control debris passing to said spray nozzle by filtering out debris larger than said openings; and

means for attaching said filter screen in a position such that said side wall surrounds said hole and said filter screen rises above the plane of said wet deck, whereby debris larger than said openings will be washed past said filter screen and not clog said filter screen.

4,390,479

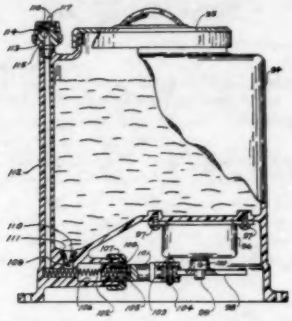
HUMIDIFYING SYSTEM FOR MOBILE VEHICLES

James T. Gates, 1611 Kirkley Rd., Columbus, Ohio 43221

Division of Ser. No. 258,642, Apr. 29, 1981, Pat. No. 4,346,048. This application Jul. 2, 1982, Ser. No. 394,518

Int. Cl.³ B60H *3/02*

U.S. Cl. 261—27 **2 Claims**



1. Apparatus for controlling the humidity of the passenger compartment of a vehicle, said compartment including a conventional cigar lighter outlet comprising, in combination:

a container for holding water, said container including an upper opening for filling purposes and a lower opening for discharge purposes, when inoperative condition:

(a) the upper opening being closed by a lid which allows air to leak into the container,

(b) said lower opening being closed by an undirectional platypus intake valve having means therein to prevent water from discharging except when the pressure within the container exceeds the pressure on the other side of the valve,

(c) said lower opening leading into a passage, said passage leading to a cylinder, a reciprocal piston mounted within said cylinder and reciprocable by a motor and rotatable cam combination,

said motor being controlled by a humidity sensing device and powered by electrical current from a plug inserted into said cigar lighter outlet, said humidity sensing device being connected in series with said motor,

the motor, cam, piston combination when reciprocated in one direction causing water to be discharged from the cylinder and when reciprocated in the other direction creating a vacuum downstream of said valve which causes it to open and water to flow from the container into said cylinder,

the water which is discharged from said cylinder being delivered through a duct to a spray nozzle which sprays a vapor into the compartment.

4,390,480

CARBURETTORS WITH ACCELERATION PUMP

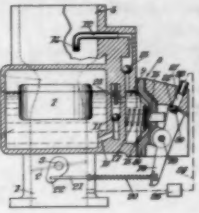
Guy Noisier, Brunoy, France, assignor to Societe Industrielle de Brevets et D'Etudes (SIBE), Neuilly sur Seine, France

Filed Jun. 2, 1981, Ser. No. 269,616

Claims priority, application France, Jun. 19, 1980, 80 13624

Int. Cl.³ F02M *7/08*

U.S. Cl. 261—34 A **2 Claims**



1. A carburettor for an internal combustion engine having an acceleration pump whose variable volume chamber is connected to a float chamber through an inlet passage and to the part of the induction passage of the carburettor situated upstream of an operator operable throttle member through a delivery passage having a delivery check valve, said variable volume chamber being defined by a movable wall mechanically connected to said throttle member by a mechanical linkage and arranged to actuate said movable wall to reduce the volume of the chamber in response to opening movement of said throttle member, wherein a locking device is provided for disabling the acceleration pump as long as the engine is stopped and comprises a ball guided in a passage provided in the body of the carburettor, movable between a rest position in which it projects outside the body into a cavity provided in a lever of said mechanical linkage controlling the pump so as to secure said lever against movement and a disengaged position into which it is brought by said depression.

4,390,481

APPARATUS FOR SPRAYING TRICKLER PLATES WITH COOLING WATER

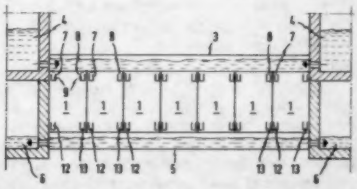
Günter Ernst, Karlsruhe, and Dieter Wurz, Pfinztal, both of Fed. Rep. of Germany, assignors to Aktiebolag Carl Munters, Sollenguna, Sweden

Filed May 28, 1981, Ser. No. 267,995

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021202

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—112 **7 Claims**



1. Apparatus for spraying trickler plates with cooling water, which comprises:

a plurality of parallelly disposed trickler plates, each of which has a surface pattern formed in the upper surface thereof for uniform distribution of the water to be cooled; and

means for distributing water to be cooled, said water distri-

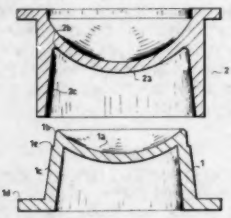
bution means including at least one water distribution channel extending above and parallel to said trickler plates, and at least one water spray channel disposed below said water distribution channel and transversely to said trickler plates, said water spray channel being formed by lugs, each of which at least partially surrounds the periphery of an opening formed in the upper portion of a respective trickler plate and extends outwardly from a surface thereof to bridge the spacing between adjacent trickler plates, said distribution channel having formed in the lower surface thereof at least one opening positioned at the intersection of said distribution channel and said spray channel, said spray channel having an open upper surface to receive water distributed by said distribution channel and gravitating through said distribution channel opening, said spray channel having a plurality of outlet openings formed in at least one lateral side thereof and directed tangentially toward said trickler plates, each outlet opening being positioned in close proximity to the upper surface of a corresponding trickler plate to provide said surface with said water to be cooled.

4,390,482

METHOD FOR MOLDING CONTACT LENSES USING MICROWAVE ENERGY

Bernard Feurer, Saint-Orens-de Gameville, France, assignor to Alcon Pharmaceuticals Limited, Cham, Switzerland

Filed Feb. 27, 1981, Ser. No. 238,963
Claims priority, application France, Feb. 28, 1980, 80 04751
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.4 12 Claims



1. A method for producing a finished contact lens comprising:

providing a mold of male and female parts substantially transparent to microwave energy within the range of about 10^6 Hz to 10^{11} Hz, said mold having a heat capacity significantly greater than the amount of the composition being molded whereby heat generated during molding may be dissipated without raising the temperature of said mold above about 40° C., each said male and female part having a unitary mold surface rigid at temperatures below about 40° C., said parts being adapted to interfit with the peripheries of said mold surfaces in contact so as to form an airtight closed mold cavity, said unitary male mold surface and said unitary female mold surface alone forming in its entirety the final undeformed shape of the lens to be molded, introducing a polymerizable lens forming monomer into said mold cavity and interfitting said mold parts so as to close said mold cavity, irradiating said monomer containing mold substantially uniformly with microwave energy at a frequency within the range of about 10^6 Hz to 10^{11} Hz and at a power density such as to keep the temperature of said mold below about 40° C. so as to polymerize said monomer without detachment of the lens material from said mold surfaces and without deformation of said mold surfaces, and removing the lens from said mold.

4,390,483

METHOD FOR MAKING UREA PRILLS AND UREA PRILLS OBTAINED BY APPLYING THIS METHOD

Michael H. Willems, and Jan W. Klok, both of Geleen, Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed Mar. 27, 1981, Ser. No. 248,439
Claims priority, application Netherlands, Mar. 29, 1980, 8001876
Int. Cl.³ B01J *2/04*
U.S. Cl. 264—7 9 Claims

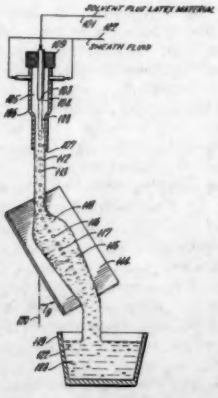
1. In a method for prilling urea wherein molten droplets of substantially water free urea are cooled to solidification by passing said droplets downwardly through a cooling zone countercurrent to a cooling gas in which a seeding material has been dispersed, the improvement comprising maintaining in at least a portion of said cooling zone a cooling gas having dispersed therein crystalline particles, which are capable of initiating urea crystallization, having dimensions of between 2 and 10 microns in a quantity of between about 8 and 25 mg/m³ of said cooling gas at ambient temperature and pressure.

4,390,484

METHODS FOR PROMOTING THE FORMATION OF MICROPARTICLES

Igino Lombardo, Sharon, and Peter J. Natale, Canton, both of Mass., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Division of Ser. No. 258,714, Apr. 29, 1981, Pat. No. 4,375,347.
This application Jul. 26, 1982, Ser. No. 401,671
Int. Cl.³ B01J *2/06*
U.S. Cl. 264—9 4 Claims



1. A method for forming microparticles from a flowing

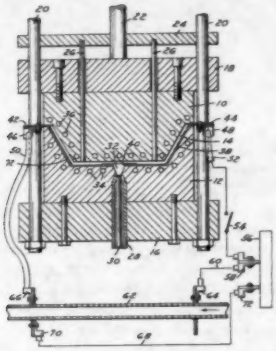
stream of a core liquid ejected from the exit of a vibrating nozzle concurrently and coaxially into a flowing stream of a sheath liquid forming a composite liquid stream having a longitudinal axis, wherein droplets formed of said liquid within said sheath liquid stream are formed into microparticles, said method of forming microparticles comprising: transferring the momentum of said droplets to a hydrophobic material for generating shear forces which slow the droplets but which do not substantially rupture the droplets to thereby promote the formation of said microparticles from said droplets.

4,390,485

METHOD OF INJECTION MOLDING A FOAMED RESIN PRODUCT HAVING A SMOOTH SURFACE INVOLVING SURFACE HEATING OF THE MOLD BY APPLYING HIGH CURRENT LOW VOLTAGE ELECTRIC POWER

Wen-Jei Yang, 3925 Waldenwood, Ann Arbor, Mich. 48104

Filed Jan. 7, 1982, Ser. No. 337,852
Int. Cl.³ B29D *27/00*; B29F *1/022*
U.S. Cl. 264—25 **6 Claims**



1. A process for quickly manufacturing injection molded foamed resin products with a smooth surface finish comprising the steps of:

closing the injection mold,

applying high current low voltage electric power to a heater band on the surface of the mold cavity to substantially increase the mold surface temperature within a matter of seconds or less in those portions of the mold cavity covered by the heater band,

disconnecting the high current low voltage electric power from the heater band,

injecting a molten foamable resin into the mold cavity, the foamable resin thereupon expanding against the hot heater band,

reducing the temperature of the resin in the mold cavity below the heat distortion temperature of the resin by cooling the mold and heater band, and,

opening the injection mold and removing the plastic product.

4,390,486

METHOD AND APPARATUS FOR HEATING A MOLD CAVITY UNIFORMLY

James W. Hendry, Englewood, Tenn., and Je-Chin Han, College Station, Tex., assignors to Ex-Cell-O Corporation, Troy, Mich.

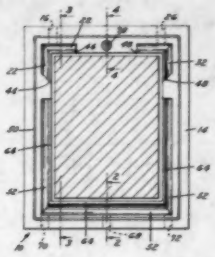
Filed Mar. 19, 1981, Ser. No. 245,563
Int. Cl.³ B29D *27/00*; B29F *1/00*
U.S. Cl. 264—45.5 **10 Claims**

1. A process for injection foam molding a thermoplastic plastic resin composition in an injection molding means comprising the steps of:

(a) closing said mold means;

(b) selectively closing a valve means to seal passage means interposed between sprue means and the mold cavity means;

(c) selectively flowing a condensable vapor heated above the heat distortion temperature of said resin into said cavity means along peripheral portions thereof, said valve means closing off the sprue means from the condensable vapor;



(d) selectively opening an outlet means from said cavity to vent condensate from said cavity means along other peripheral portions thereof;

(e) opening said sealing valve means and injecting foamable thermoplastic resin into said sprue means and said resin flowing through said passage means to said cavity;

(f) cooling said mold means by flowing chilled fluid through said mold means;

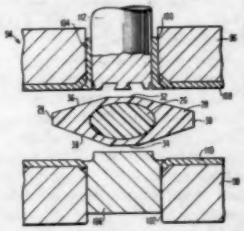
(g) opening said mold upon solidification of said resin and removing solidified part.

4,390,487

METHOD OF MAKING A LAMINATED RECORDED DISC

Kerry D. O'Mara, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1982, Ser. No. 343,016
Int. Cl.³ B29D *17/00*
U.S. Cl. 264—107 **11 Claims**



1. A method of making a laminated recorded disc which has an outer surface layer of a first thermoplastic material on opposite sides of a thermoplastic core material comprising the step of

(a) forming a preform having a surface layer of the first material completely surrounding the core material,

(b) placing said preform between the platens of a molding press,

(c) heating the platens and closing them against the preform to heat the preform to a temperature at which the materials of the preform flow radially outwardly under the

pressure of the platens until the materials fill the mold cavity provided between the platens to form the laminated disc, and then

(d) cooling the molded disc to harden the materials of the disc.

4,390,488

PRESSING METAL POWDER INTO SHAPES

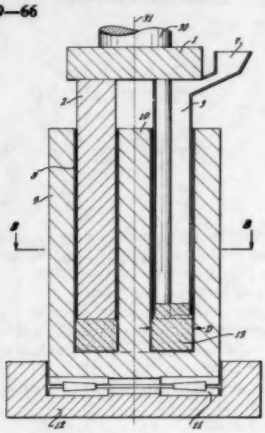
Otto Wessel, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,099

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2745020

Int. Cl.³ D04H *1/20*

U.S. Cl. 419—66 3 Claims



1. A method for pressing metal powder to form a consolidated body having an axial dimension and at least one dimension transverse to that axial dimension, comprising:

(a) Inserting a sheet metal container into a closely fitted die cavity, the container having an open, axial end and internal axial and transverse dimension, corresponding to said dimensions of said body to be formed;

(b) inserting into the said container an axially alligned press punch having an internal duct for pouring said metal powder therethrough;

(c) pouring a mass of that metal powder through said internal duct to partially fill said container to less than a full azimuthal section of that container and to a height along said axial dimension within that container not exeeding about 1.5 times that transverse dimension;

(d) lifting said press punch within said container after the pouring as per step (c);

(e) rotating said press punch about its axial dimension by less than 360° degrees;

(f) moving said press punch downwardly to compress and bond said powder portion into a consolidated mass as an initial portion of said body to be formed;

(g) lifting said press punch from said compressed mass and pouring through said duct an additional mass of said powder, upon and next to said consolidated mass in what amounts to less than a full azimuthal section and also to a height not exceeding 1.5 times that transverse dimension, following which steps (e) and (f) are repeated;

(h) repeating the steps (g), (e), and (f) to cause said formed body to grow azimuthally and in height while bonding each of the masses of added powder thereto until the final size of the body is attained; and

(i) removing said container with said final body from said die cavity.

4,390,489

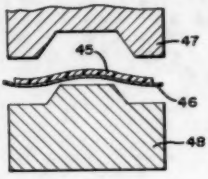
METHOD OF SHAPING THERMOPLASTIC COMPOSITIONS ON ALUMINUM FOIL SUPPORT

Leon Segal, Morristown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 861,487, Dec. 19, 1977, abandoned, which is a continuation of Ser. No. 321,077, Jan. 4, 1973, abandoned. This application May 27, 1980, Ser. No. 153,244

Int. Cl.³ B29D *3/02;* B29F *5/00*

U.S. Cl. 264—126 18 Claims



1. A method of making stamped articles of thermoplastic composition having a removably adhering metal foil supporting layer, where the total average thickness of the thermoplastic article plus the metal foil layer is at least ten times as great as the thickness of the metal layer, comprising the steps of:

placing the thermoplastic composition on the metal foil layer prior to heating, the metal foil having a flexural modulus of less than 40×10^6 psi, the thickness of the foil being:

0.0025 inches or less when the total average thickness of the thermoplastic article plus the metal foil is less than 0.060 inches,

0.004 inches or less when the total average thickness is less than 0.125 inches, and

0.006 inches or less when the total average thickness is greater than 0.125;

preheating the metal foil and thermoplastic composition located and supported upon the metal foil to above the softening point of the thermoplastic composition;

transferring the preheated metal foil and thermoplastic composition located and supported upon the metal foil to a stamping press;

stamping the metal foil and thermoplastic composition located on the metal foil in a stamping press whereby the stamped article is formed.

4,390,490

FIBROUS CASING EXTRUSION

Thomas W. Martinek, Covington, Ind., and George M. Wilmsen, Danville, Ill., assignors to Teepak, Inc., Chicago, Ill.

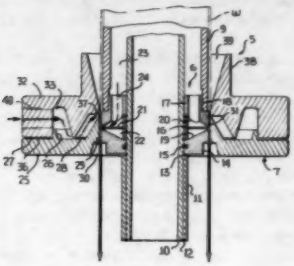
Filed Apr. 7, 1980, Ser. No. 138,068

Int. Cl.³ B29F *3/10;* D01F *2/06*

U.S. Cl. 264—173 13 Claims

2. A method of forming sausage casing, said method comprising the steps of providing an elongated coating orifice of a size sufficient to supply coating liquid required for complete penetration of a selected fibrous web, passing the selected fibrous web in tubular form through said coating orifice, directing viscose into the coating orifice through a supply opening into the coating orifice on at least one side of the web, and said coating orifice further being sized sufficient and the vol-

ume of viscose supplied being in an amount sufficient to maintain laminar flow of the viscose through the coating orifice



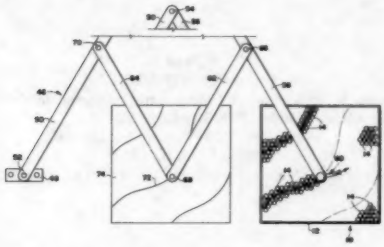
alongside said fibrous web whereby said web is fully and substantially instantaneously penetrated by said coating liquid.

4,390,491

THREE DIMENSIONAL CONTOUR APPARATUS AND METHOD

Jerry D. Woodall, 2010 E. 51st, Apt. A, Tulsa, Okla. 74105

Filed Mar. 25, 1982, Ser. No. 361,593
Int. Cl.³ B29C *1/02*
U.S. Cl. 264—219 **8 Claims**



1. Apparatus for constructing a three dimensional scale model and comprising housing means having a plurality of upright side-by-side tube members disposed therein, the housing having the upper and lower ends thereof open and the lower end thereof disposed in open communication with a liquid reservoir, the lower end of each tube member being disposed in the liquid reservoir, check valve means provided in the lower end of each tube for controlling the admission of the liquid to the interior of the tube in response to selected pressure differentials between the interior of the tube and the ambient pressure acting on the surface of the surrounding liquid reservoir, pantograph type tracing means having means for tracing an original depiction and transmitting a corresponding tracing to the open upper ends of the tubes and admitting a reduced pressure condition to the interior of a tube traced thereby, a second housing means adapted to be supported above the first mentioned housing means, pin means disposed in the second housing in upright side-by-side arrangement in substantial axial alignment with the tubes disposed therebelow and slideably engagable with the respective tube for resting on the surface of any liquid contained therein, the upper ends of the pins projecting above the open upper ends of the tubes to define contours corresponding to the original depiction for receiving mold forming materials thereover, said mold conforming to a scale model of the original depiction.

8. A method of constructing a three dimensional scale model corresponding to an original depiction and comprising the steps of applying selected pressure differentials between liquid columns and a liquid reservoir for controlling the elevation of the liquid in each liquid column, supporting support members from the surface of each liquid column to define a scale model representation corresponding to the original depiction, and forming a material over the support members to provide a mold for the forming of the three dimensional scale model.

4,390,492

GLOVE MOLDING METHOD AND APPARATUS

Leonard D. Kurtz, Woodmere, N.Y., assignor to BioResearch Inc., Farmingdale, N.Y.

Filed Feb. 29, 1980, Ser. No. 125,925
Int. Cl.³ B29C *13/00*
U.S. Cl. 264—255 **3 Claims**

1. A method of manufacturing gloves comprising the steps of forming a glove mold with separate fingers having the tips of the fingers and spaces between the fingers formed as non-rounded, non-horizontal angles surfaces, heating the mold to approximately 140° F., dipping the mold cuff end first into a polymer latex bath so as to provide a polymer coating on the mold, slowly withdrawing the mold fingers first come from the polymer latex bath, cooling the mold, applying a rubber latex coating over the polymer coating, and applying a final polymer latex coating.

4,390,493

PROCESS FOR INJECTION MOLDING A POLYESTER WITH IMPROVED CRYSTALLIZATION THEREOF

Koichi Yasui, and Jinpei Hisano, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1981, Ser. No. 229,214
Int. Cl.³ B29F *1/08*
U.S. Cl. 264—328.16 **11 Claims**

1. A process for injection molding a polyester by injection molding at a pressure of 450 Kg/cm² or less and at a mold temperature of from about 80° to about 120° C. with improved crystallization thereof, comprising incorporating, prior to molding, in the polyester as a crystallization accelerator a compound containing

(1) at least one aromatic ring selected from the group consisting of a benzene ring, a naphthalene ring and an anthracene ring;

(2) at least one sulfonic acid alkali metal salt group; and

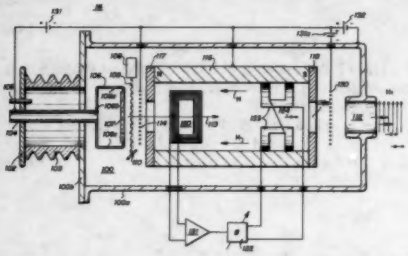
(3) at least one phenolic hydroxy alkali metal salt group in an amount of from 0.05 to 20% by weight based on the weight of the polyester.

4,390,494

DIRECTED BEAM FUSION REACTION WITH ION SPIN ALIGNMENT

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Energy Profiles, Inc., Newtown Square, Pa.

Filed Apr. 7, 1980, Ser. No. 138,139
Int. Cl.³ G21B 1/00
U.S. Cl. 376—107 **10 Claims**



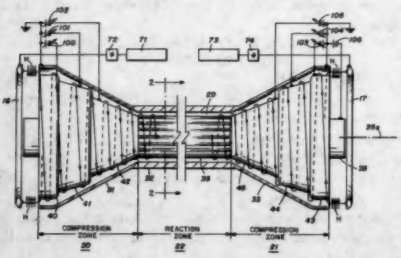
1. In a fusion reaction system where ions from two sources are forced by passage through magnetic fields to travel helically towards each other in opposite senses of rotation and directions at a common radius in a cylindrical annular reaction zone defined by two coaxial spaced apart cylindrical electrodes, the improvement comprising:
(a) establishing a low velocity beam of gaseous ions from each said source;
(b) aligning the spins of said ions while at said low velocity to produce polarized ion beams;
(c) accelerating said ions in said polarized ion beams to fusion velocities for injection into said reaction zone;
(d) applying said magnetic fields to cause opposite directional travel of said ions in said polarized ion beams;
(e) establishing a D.C. radially directed electrostatic field between said coaxial cylindrical electrodes for confining said beams to said helical paths and compressing said ion beams, said D.C. electrostatic field being applied as the confining field free of any applied magnetic field in said annular reaction zone; and
(f) injecting each of said two oppositely directed polarized ion beams into said zone.

4,390,495

CONTROL OF COLLIDING ION BEAMS

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Energy Profiles, Inc., Newtown Square, Pa.

Filed Jan. 19, 1981, Ser. No. 226,453
Int. Cl.³ G21B 1/00
U.S. Cl. 376—120 **20 Claims**



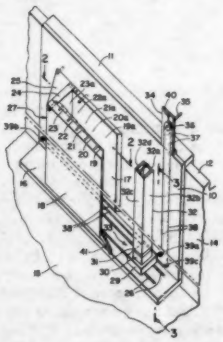
1. In a fusion reaction system where ions from two sources are to rotate about a common axis in opposite senses in orbital paths of common radii in an annular reaction zone of substantially circular symmetry at any given cross-section perpendicular to the axis of said paths and bounded by spaced apart outer and inner coaxial electrode walls for promoting collisions of ions in one beam with ions in the other beam, the improvement comprising:
(a) establishing a beam of gaseous ions from each said source;
(b) applying magnetic fields to direct opposite travel of said ions in said beams toward said orbital paths;
(c) establishing a D.C. radially directed electrostatic field between said electrodes for confining said ion beams to said orbital paths free of negatively charged particles wherein said D.C. field is applied as the confining field free of any applied magnetic confining field;
(d) injecting each of said two oppositely directed ion beams into said zone; and
(e) bunching said ions along said paths to establish a plurality of concentrations of said ions located at spaced points along said paths with said points being the same for ions from both said sources, said plurality of concentrations comprising a plurality of alternating regions of high and low concentrations corresponding to regions of high and low electric fields.

4,390,496

GAGING DEVICE

Donald R. Wozniak, El Cajon, Calif., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Oct. 31, 1980, Ser. No. 202,616
Int. Cl.³ G21C 17/00
U.S. Cl. 376—245 **5 Claims**



1. In a nuclear reactor having a deep water storage basin for irradiated members including fuel channels, a measuring system for measuring radiation induced fuel channel distortion while the fuel channels are under water in which a gage assembly is suspended under water in said storage basin, said gage assembly comprising a guide plate and a plurality of elongated stepped gage plates supported in juxtaposed spaced relation to said guide plate and thereby forming a plurality of graduated elongated gage spaces decreasing in width in a predetermined direction, and means for moving a fuel channel in said predetermined direction into said gage spaces and then moving it out of the same.

4,390,497
THERMAL-MECHANICAL TREATMENT OF COMPOSITE NUCLEAR FUEL ELEMENT CLADDING

Herman S. Rosenbaum, Fremont, and John H. Davies, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 45,225, Jun. 4, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 304,011
Int. Cl.³ G21C 3/20
U.S. Cl. 376—414 25 Claims

TUBE REDUCTION AND TREATMENT

STEP NO.	STEP	THICKNESS OF COMPOSITE	OUTER DIAMETER	INNER DIAMETER
	START WITH TUBE SHELL	0.450	2.5	1.64
(1)	CLEAN FOR ANNEAL [illegible]			
(2)	ANNEAL - 1250° F - 1 HOUR			
(3)	FIRST REDUCTION PASS	0.22	1.45	1.01
(4)	CLEAN FOR ANNEAL			
(5)	ANNEAL - 1150° F - 1 HOUR			
(6)	SECOND REDUCTION PASS	0.095	0.800	0.610
(7)	CLEAN FOR ANNEAL			
(8)	ANNEAL - 1150° F - 1 HOUR			
(9)	THIRD REDUCTION PASS	0.035	0.400	0.415
(10)	SHOT PEEN INNER SURFACE			
(11)	CLEAN FOR HEAT TREATMENT			
(12)	HEAT TREAT 900° F - 4 HOURS			
(13)	ETCH TO ⟶	0.032	0.404	0.420

FINAL THICKNESS OF BARRIER LAYER = 3.4 ± 0.5 mils

1. A method of making an elongated composite cladding tube for containing nuclear fuel as a fuel element for a nuclear reactor, said cladding tube being formed from a cladding tube shell comprised of a zirconium alloy tube containing constituents other than zirconium in an amount greater than about 5000 parts per million and having a protective barrier layer of zirconium metal containing impurities of less than 5000 parts per million metallurgically bonded to the inside surface thereof, said protective barrier of zirconium metal being about 1 to about 30 percent of the thickness of the composite cladding tube, consisting essentially of the steps of:

(1) reducing the diameter of said cladding tube shell composed of the zirconium alloy tube with the protective zirconium metal layer bonded to the inside surface thereof by cold working in a series of reduction steps to the desired inside diameter and wall thickness;

(2) heat treating said cladding tube shell between each of said reduction steps at a temperature and for a time period sufficient to substantially fully recrystallize said zirconium alloy;

(3) heat treating said cladding tube after the final one of said reduction steps at a lower temperature and for a time period which allows substantially complete recrystallization of said zirconium metal layer and provides a fine-grained microstructure therein and which stress-relieves but does not fully recrystallize said zirconium alloy.

4,390,498
TITANIUM-BORON ADDITIVE ALLOYS

Leon A. Luyckx, 226 Hazelcroft Ave., New Castle, Pa. 16105

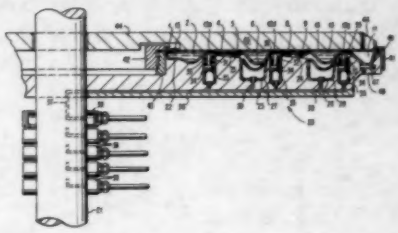
Continuation-in-part of Ser. No. 146,452, May 5, 1980, Pat. No. 4,311,523. This application Jul. 17, 1981, Ser. No. 284,198
The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.
Int. Cl.³ C22C 14/00
U.S. Cl. 420—420 10 Claims

1. A high concentration titanium-boron additive alloy for addition to liquid metal such as steel comprising about 60% to 78% titanium, about 1.3% to 4.5% boron and the balance iron with usual impurities in ordinary amounts.

4,390,499
CHEMICAL ANALYSIS SYSTEM INCLUDING A TEST PACKAGE AND ROTOR COMBINATION

Huntington W. Curtis, Chelsea, N.Y.; Robert M. Kellogg, Washington Crossing, Pa.; Kerry W. Kissinger, Pennington, N.J.; Robert P. Mappes, Cranbury, N.J., and Emery J. Stephans, Plainsboro, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,384
Int. Cl.³ G01N 21/07, 35/00
U.S. Cl. 422—72 8 Claims



1. Chemical analysis apparatus comprising in combination a rotor having means adapted to support at least one test package therewithin,

at least one test package receivable in said rotor comprising:

a flexible sample compartment for receiving a biological fluid sample therein,

at least one flexible reagent storage compartment disposed in breakable, sealed relationship with said sample compartment,

a flexible cuvette disposed in breakable, sealed relationship with said reagent storage compartment,

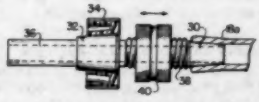
said flexible cuvette being positioned outermost in said rotor, and,

means integral with said rotor for rupturing the breakable, sealed relationship between said sample compartment, said reagent storage compartment and said cuvette.

4,390,500
ROTARY EVAPORATOR SHAFT

Robert J. Miskinis, 9758 Airport Vista Rd., Santee, Calif. 92071

Filed Sep. 25, 1981, Ser. No. 305,617
Int. Cl.³ B01D 3/00; B01L 3/08, 11/00
U.S. Cl. 422—103 2 Claims



1. A joint extractor assembly for separating male to female, ground glass to polymer resin, joints having standard tapers comprising in combination:

a polymer resin hollow cylindrical member having two spaced apart end tapered male joint surfaces and an intermediate threaded portion; said tapered joints being tapered outwardly from the intermediate threaded portion respectively to engage complementary tapered female surfaces of members to be joined;

an extractor nut threadedly mounted, and axially movable in either direction, on the intermediate threaded portion of the cylindrical member;

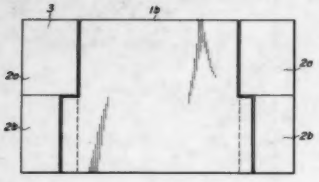
said extractor nut being dimensioned to initially engage an end of either female member for applying an axially force

on said female members to enable the male members to be withdrawn from their respective female member.

4,390,501
HIGH TEMPERATURE GAS DISTRIBUTOR FOR FLUIDIZED BED

Kazuo Tanaami, Ebina, and Nobuo Matsuda, Kamakura, both of Japan, assignors to Director-General, Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,942
Claims priority, application Japan, Apr. 9, 1980, 55-45619
Int. Cl.³ F27B *15/10*
U.S. Cl. 422—143 **5 Claims**



1. A high temperaature gas distributor for a fluidized bed, which comprises:

a first pair of electrocast zirconia refractory supporting bricks (*2a*) each having a plurality of spaced elongated substantially straight grooves (3) formed therein at given intervals, said first pair of refractory supporting bricks (*2a*) being positioned with a space therebetween and with said grooves (3) of each said supporting brick facing each other, said first pair of refractory supporting bricks having opposing sides;

a second pair of electrocast zirconia refractory supporting bricks (*2b*) each having a plurality of spaced elongated substantially straight grooves therein at given intervals, said grooves of said second pair of refractory supporting bricks (*2b*) being positioned so as to register with portions between the grooves of said first pair of refractory supporting bricks (*2a*), said second pair of refractory supporting bricks (*2b*) being positioned with a space therebetween and with said grooves thereof facing each other;

a first plurality of substantially flat generally T-shaped electrocast zirconia brick plates (*1a*) arranged between said first pair of supporting bricks (*2a*), a cross portion of each of said first plurality of generally T-shaped plates having substantially straight opposed ends inserted into respective substantially straight grooves (3) of said first pair of supporting bricks (*2a*), said opposed ends of said cross portions of said first plurality of generally T-shaped plates being secured in said grooves of said first pair of supporting bricks (*2a*) by mortar;

a second plurality of substantially flat generally T-shaped electrocast zirconia brick plates (*1b*) of reverse shape relative to said first plurality of generally T-shaped electrocast zirconia brick plates (*1a*), said second plurality of generally T-shaped plates (*1b*) being arranged between said second pair of supporting bricks (*2b*), a cross portion of each of said second plurality of generally T-shaped plats having substantially straight opposed ends inserted into respective substantially straight grooves (3) of said second pair of supporting bricks (*2b*), said opposed ends of said cross portions of said second plurality of generally T-shaped plates being secured in said grooves of said second pair of supporting bricks (*2b*) by mortar;

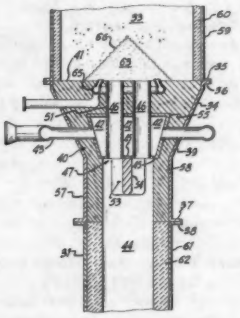
said first and second pluralities of plates (*1a, 1b*) being alternately arranged adjacent and spaced from each other such that both ends of the cross portion of said T-shaped plates are inserted into respective grooves of respective refractory supporting bricks, the leg portions of said generally T-shaped plates being interposed between the cross portions of the adjacent generally T-shaped plates to provide respective gas flow paths between alternately adjacent, spaced, generally T-shaped first and second plates; and

refractory holding bricks (4) arranged at at least one side of said at least one pair of said first and second pairs of refractory supporting bricks and adjacent at least one end of said plates in the grooves thereof for holding said refractory supporting bricks and the ends of said plates in relative position.

4,390,502
SOLIDS FEEDING DEVICE AND SYSTEM

Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 165,786, Jul. 3, 1981, Pat. No. 4,352,728, which is a continuation-in-part of Ser. No. 89,951, Oct. 22, 1979, Pat. No. 4,338,187. This application Nov. 6, 1981, Ser. No. 318,926
Int. Cl.³ F27B *15/08*
U.S. Cl. 422—145 **9 Claims**



1. In a TRC apparatus having a tubular thermal cracking reactor, means for delivering hot inert particulate solids to the reactor and means for delivering hydrocarbon feed or hydrodesulfurized residual oil fluid feed to the reactor and wherein the temperature in the reaction chamber cracking zone is between 1300° and 2500° F. and wherein the hydrocarbon fluid feed or the hydrosulfurization residual oil fluid feed along with the entrained inert particulate solids and the diluent gas are passed through the cracking zone for a residence time of 0.05 to 2 seconds, the improvement comprising an apparatus for continuously feeding a regulated flow of particulate solids to the reaction chamber and for admixing the solids rapidly and intimately with the fluid feed introduced simultaneously thereto comprising:

a. an upper reservoir containing the particulate solids;

b. a conduit extending downwardly from the reservoir to the reaction chamber, said conduit being in open communication with the reservoir and the reaction chamber;

c. means for introducing a quantity of aeration gas to the upper reservoir in the vicinity above the conduit, to locally fluidize the solids proximate to the conduit causing said locally fluidized solids and a portion of the aeration gas to flow through the conduit; and

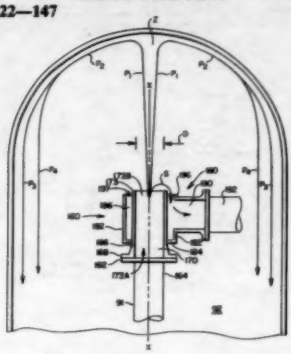
d. means for introducing the fluid feed to the reaction chamber angularly to the flow of solids such that the projected flow of feed intercepts the discharge flow of solids leaving the conduit.

4,390,503

CARBOMETALLIC OIL CONVERSION WITH BALLISTIC SEPARATION

Paul W. Walters, Ashland; Roger M. Benslay, Catlettsburg, and Dwight F. Barger, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 13, 1981, Ser. No. 263,394
Int. Cl.³ F27B *15/08*
U.S. Cl. 422—147 **5 Claims**



1. Apparatus means for effecting separation of gasiform material from a stream of suspended solid particles comprising in combination,

an elongated tubular riser means open in the upper end thereof,

an upper portion of said riser located within a larger disengagement chamber, the upper open end of said tubular riser means positioned below the top of said disengagement chamber, an annular chamber means open in the upper end thereof about an upper end portion of said tubular riser means, said annular chamber being in open communication in an upper portion with said open end riser means, radiating open end conduit means in open communication with said annular chamber in one end thereof and with means for attaching cyclone separating means on the opposite end thereof either within or external to said disengaging chamber means.

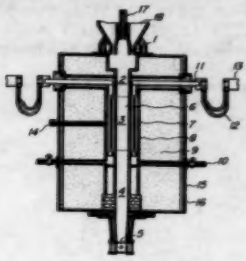
4,390,504

APPARATUS FOR PRODUCING SILICON CARBIDE CONSISTING MAINLY OF β-TYPE CRYSTAL

Ryo Enomoto, Ohgaki; Michihiro Yoshioka, Gifu, and Takao Yokoyama, Ohgaki, all of Japan, assignors to Ibigawa Electric Industry Co. Ltd., Gifu, Japan

Continuation of Ser. No. 119,978, Feb. 8, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,964
Claims priority, application Japan, Feb. 21, 1979, 54-18463
Int. Cl.³ B01J *19/02*
U.S. Cl. 422—166 **13 Claims**

1. An apparatus for the continuous production of silicon carbide consisting mainly of β-type crystal, the apparatus comprising a gravity-free reaction vessel having an inlet for charging starting materials by contacting said materials with effluent gases, a heating zone, a cooling zone and a closable outlet for a product, sequentially communicated in this order, the heating zone comprising a graphite cylinder, electrically indirect heating means for heating the starting materials, and a heat insulating layer composed essentially of fine powders selected from the group consisting of graphite, carbonaceous materials, and mixtures thereof, said insualting layer being arranged on the outside of at least the heating zone, wherein a horizontal inner cross-sectional area of the preheating zone is



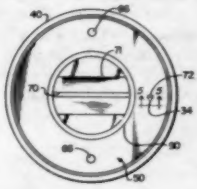
at least about 1.4 times larger than a horizontal inner cross sectional area of the heating zone.

4,390,505

CRYSTAL GROWTH APPARATUS

Aaron S. Taylor, Acton, and Vernon E. White, Needham, both of Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Filed Mar. 30, 1981, Ser. No. 248,838
Int. Cl.³ C30B *15/34*
U.S. Cl. 422—246 **12 Claims**



1. Apparatus for growing a crystalline ribbon-like body from a melt comprising:

a furnace enclosure,

a crucible disposed within the enclosure for containing a melt,

means for applying heat to the melt in the crucible,

a capillary die extending into the crucible and arranged for supplying melt to a meniscus formed between the die and a growing crystalline body,

a heat shield plate surrounding the upper end of the capillary die, said plate extending transversely of the die,

means supporting said heat shield plate for pivotal movement about a horizontal axis so that a portion of the heat shield plate may be raised or lowered relative to the upper end of the capillary die and the effect of movement of the heat shield plate on the thermal field surrounding the upper end of the die is greatest at the outer edge of said portion, and

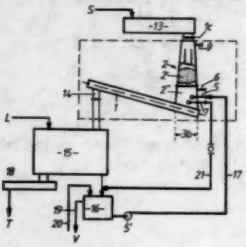
operating means for pivoting said heat shield plate, said operating means comprising actuating means disposed outside of said furnace enclosure.

4,390,506

APPARATUS FOR TROUBLE-FREE AND CONTINUOUS CHARGING OF EXTRACTORS WITH EXTRACTION FEEDSTOCK TO BE TREATED AND WITH EXTRACTANT OR SOLVENT

Heinz O. Schumacher, Höperfeld 26, D-2050 Hamburg 80, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,956
Int. Cl.³ B01D 11/02
U.S. Cl. 422—273 10 Claims



1. Apparatus for continuous charging of extractors with extraction feedstock and extractant which comprises an extractor, a closed system upstream from the extractor and communicating therewith comprising a vertical feeding and equalizing vessel, means for feeding feedstock to said vessel, and means for feeding extractant to said vessel communicating with said extractor for recycling, and a feed screw as a mixing means for extraction feedstock and extractant communicating with said vessel at the lower region thereof having a discharge outlet to the extractor at the upper region thereof, wherein said screw is inclined with respect to the horizontal and wherein the spacing of the screw turns in the area of the feeding and equalizing vessel increases continuously in the direction towards the discharge outlet to the extractor, said feeding and equalizing vessel being mounted on the screw in a manner providing an airtight seal between the vessel and the screw and providing together with the inclination of the screw that the screw is constantly filled with extraction feedstock and extractant.

4,390,507

PROCESS FOR RECOVERING YTTRIUM AND LANTHANIDES FROM WET-PROCESS PHOSPHORIC ACID

Cornelis A. M. Weterings, Stein, and Johannes A. Janssen, Schinveld, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 24, 1981, Ser. No. 257,116
Claims priority, application Netherlands, Apr. 26, 1980, 8002462
Int. Cl.³ B01D 11/00; C01F 17/00; C22B 59/00; C01B 25/16
U.S. Cl. 423—8 8 Claims

1. Process for recovering yttrium and lanthanides from wet-process phospheric acid comprising the steps of:

(a) adding a flocculant to wet-process phosphoric acid to form a precipitate;

(b) separating out the resultant precipitate;

(c) recovering yttrium and lanthanides from the separated out precipitate by:

(i) treating said precipitate with an acid to form an acid liquid; and

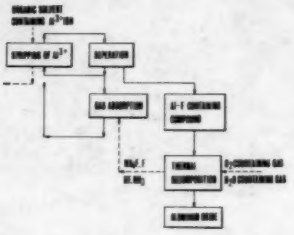
(ii) separating yttrium and lanthanides from the acid liquid.

4,390,508

PROCESS FOR RECOVERY OF ALUMINUM OXIDE FROM ALUMINUM COMPOUNDS CONTAINING FLUORINE

Morio Watanabe, Amagasaki; Sanji Nishimura, Kyoto, and Nobuatsu Watanabe, Nagaokakyo, all of Japan, assignors to Solex Research Corporation of Japan, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,294
Claims priority, application Japan, Dec. 29, 1980, 55-187599
Int. Cl.³ C01F 7/02
U.S. Cl. 423—112 2 Claims



1. A process for the production of aluminum oxide from $(NH_4)_3AlF_6$ or K_3AlF_6 comprising:

(1) extracting aluminum ions with an organic solvent containing one or more compounds selected from the groups of alkyl phosphoric acid, alkyl and aryl thio phosphoric acid, carboxylic acid and hydroxime together with a petroleum hydrocarbon as a diluent;

(2) preparing crystals of $(NH_4)_3AlF_6$ or K_3AlF_6 by stripping the aluminum ions in the resultant organic solvent from step (1) in contact with an aqueous solution containing one or more compounds selected from the group consisting of NH_4HF_2, NH_4F or KHF_2 and simultaneously regenerating the organic solvent;

(3) separating said crystals;

(4) producing aluminum oxide by heating the resultant crystals from step (3) in a gas stream containing oxygen, H_2O, or H_2; and

(5) recycling the gas generated during the heating of step (4) to the aqueous solution of step (2).

4,390,509

PROCESS FOR MANUFACTURING AMMONIUM PHOSPHATE UTILIZING AN OXALIC ACID ACIDULATING PROCESS

Charles W. Weston, Prarieville, and Padraic S. O'Neill, Baton Rouge, both of La., assignors to Agrico Chemical Company, Tulsa, Okla.

Continuation of Ser. No. 128,885, Mar. 10, 1980, abandoned. This application Apr. 16, 1981, Ser. No. 254,647
Int. Cl.³ C01B 15/16, 25/26
U.S. Cl. 423—313 10 Claims

1. A process for manufacturing ammonium phosphate utilizing synthesis gas, air and phosphate rock comprising:

(a) separating synthesis gas into carbon monoxide and hydrogen fractions;

(b) separating air into nitrogen and oxygen fractions;

(c) reacting the carbon monoxide fraction and the oxygen fraction with water to form oxalic acid;

(d) reacting the hydrogen fraction with the nitrogen fraction to form ammonia;

(e) digesting phosphate rock with an acid solution comprising oxalic acid from step (c) and another acid for increasing the solubility of phosphate rock in the acid solution to form a slurry and thereby produce phosphoric acid and precipitated impurities including calcium oxalate;

(f) separating the precipitated impurities from the phosphoric acid formed in step (e); and

(g) reacting the phosphoric acid from step (f) with the ammonia to form ammonium phosphate.

4,390,510
PROCESS FOR TREATING SPENT SILICON-CONTAINING REACTION MASSES TO PRODUCE HALOSILANES

Alan Ritzer, City Sand Lake, N.Y.; Bakulesh Shah, Corpus Christi, Tex., and Daniel E. Sliva, Scotia, N.Y., assignors to General Electric Company, Waterford, N.Y.

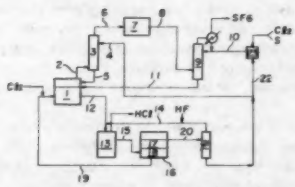
Filed Feb. 16, 1982, Ser. No. 349,139
Int. Cl.³ C01B 33/08
U.S. Cl. 423—342 23 Claims

1. A process for preparing monohydrogen trihalosilane from the residual silicon obtained from the preparation of organohalosilanes by a metal-catalyzed direct process, comprising, contacting the residual silicon simultaneously with gaseous hydrogen halide and with gaseous alkyl halide to form a residual silicon contact mass and heating the residual silicon contact mass at a temperature less than the temperature at which substantial alkylation of the residual silicon contact mass occurs, whereby the residual silicon reacts at said temperature to produce reaction products containing monohydrogen-trihalosilane.

4,390,511
PROCESS FOR PRODUCING SF_6 THROUGH SF_5Cl

Yoshio Oda; Shinsuke Morikawa; Masaaki Ikemura; Tomio Yarita; Makoto Noshiro; Isao Gotoh, all of Yokohama; Yukio Jitsugiri, Yokosuka; Shigeaki Yonemori; Kimihiko Sato, both of Yokohama, and Keiichi Uchida, Kawasaki, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,887
Claims priority, application Japan, Aug. 12, 1980, 55-109809; Aug. 12, 1980, 55-109810; Sep. 26, 1980, 55-132829
Int. Cl.³ C01B 7/24, 17/45, 17/46
U.S. Cl. 423—469 7 Claims



1. A process for producing SF_6 which comprises: (a) reacting a member of the group consisting of sulfur, sulfur chloride and sulfur tetrafluoride with chlorine and an amine/hydrogen fluoride complex to produce SF_5Cl; and (b) pyrolysing said SF_5Cl to produce SF_6.

4,390,512
PROCESS FOR PRODUCING CALCIUM HYPOCHLORITE

Clifford E. Loehr, Norton; Roger A. Crawford, Wadsworth; John E. Carbaugh, Akron, and Cletus N. Welch, Clinton, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 269,241, Jun. 1, 1981, Pat. No. 4,328,200. This application Feb. 22, 1982, Ser. No. 350,653
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Int. Cl.³ C01B 11/06
U.S. Cl. 423—474 22 Claims

1. A process for preparing calcium hypochlorite which comprises,

(a) admixing with agitation in the absence of added elemental chlorine:

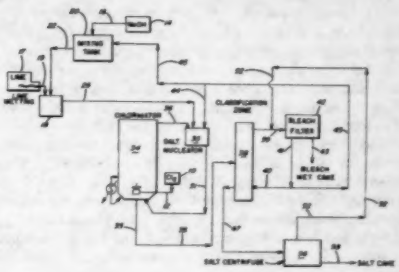
(1) aqueous solution substantially saturated with sodium chloride and calcium hypochlorite, and

(2) sodium hydroxide in amounts at least sufficient to react with substantially all of the calcium hypochlorite in said aqueous solution, thereby to form an aqueous slurry of precipitated lime,

(b) admixing lime with aqueous slurry obtained in step (a), thereby to form an aqueous lime slurry,

(c) adding further sodium hydroxide, when required, to said aqueous lime slurry, in amounts required to provide in combination with the sodium hydroxide added in step (a) substantially stoichiometric amounts thereof based on the calcium oxide content of the lime added in step (b),

(d) diluting aqueous lime slurry containing said substantially stoichiometric amount of sodium hydroxide with aqueous salt solution saturated with calcium ion and sodium chloride in amounts at least sufficient to dilute the sodium hydroxide therein,



(e) adding elemental chlorine to the diluted aqueous lime slurry of step (d) in the presence of a seed bed of sodium chloride crystals and neutral calcium hypochlorite crystals at temperatures at which loss of calcium hypochlorite by accelerated decomposition is avoided, thereby forming further neutral calcium hypochlorite crystals and sodium chloride crystals in aqueous chlorinator liquor, said sodium chloride crystals being significantly larger than the calcium hypochlorite crystals,

(f) segregating said larger crystals of sodium chloride from said crystals of calcium hypochlorite to form an aqueous slurry rich in crystals of calcium hypochlorite and an aqueous slurry rich in crystals of sodium chloride, and

(g) separating aqueous slurry rich in calcium hypochlorite crystals into a wet cake of calcium hypochlorite and mother liquor substantially saturated with sodium chloride and calcium hypochlorite.

4,390,513
PROCESS FOR MANUFACTURING FIBROUS POTASSIUM TITANATE

Yoshinori Fujiki, Sakura, Japan, assignor to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Feb. 25, 1982, Ser. No. 352,217
Claims priority, application Japan, Oct. 16, 1981, 56-165358
Int. Cl.³ C01G 23/00
U.S. Cl. 423—598 2 Claims

1. A process for manufacturing fibrous potassium titanate, which comprises heating to a temperature of 950° C. to 1300° C. potassium titanate of the general formula $K_2O.nTiO_2$ in which n is from 3 to 5, or a mixture of materials from which potassium titanate is formed, to form by decomposition a solid phase of potassium hexatitanate and a liquid phase of potassium titanate of the general formula $K_2O.nTiO_2$ ($2 \leqq n \leqq 3$), cooling said potassium hexatitanate and potassium titanate slowly to a temperature of 900° C. to 950° C., and controlling the rate of said cooling to cause a bonding of said potassium hexatitanate

and said potassium titanate to form a solid phase of potassium tetratitanate fibers, whereby potassium titanate according to said general formula in which n is from 4 to 6 is caused to grow in single crystal form.

4,390,514

METHOD OF PREPARING CHALOCOGENIDES OF GROUP VIII BY LOW TEMPERATURE PRECIPITATION FROM NONAQUEOUS SOLUTION, THE PRODUCTS PRODUCED BY SAID METHOD AND THEIR USE AS CATALYSTS

Russell R. Chianelli, North Branch, and Theresa A. Pecoraro, Middletown, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 37,390, May 9, 1979, abandoned, which is a continuation of Ser. No. 797,011, May 7, 1977, abandoned. This application Nov. 12, 1980, Ser. No. 206,053

Int. Cl.³ C01B *17/20, 19/00;* C01G *1/12, 55/00;*

U.S. Cl. 423—509 17 Claims

1. A method for the preparation of chalcogenides of the formula MX_y wherein M is a metal selected from the group consisting of ruthenium, rhodium, iridium and osmium, X is selected from the group consisting of sulfur, selenium, tellurium and mixtures thereof, and y is a number ranging from about 0.1 to about 3, which comprises reacting neat a solution of ruthenium, rhodium, iridium or osmium with a source of sulfide, selenide or telluride ion selected from the group consisting of K_2X, KHX, Li_2X, LiHX, $(NH_4)_2X$, $(NH_4)HX$, Na_2X, NaHX, $(RNH_3)_2X$, $(R_1R'NH_2)_2X$, $(R_1R_1'R''NH)_2X$ wherein R, R' and R'' are the same or different and are selected from the group consisting of C_1 to C_{20} alkyl and C_6 to C_{20} alkyl groups, and X is sulfur, selenium or tellurium, at a temperature of from −78° to 400° C. for a time sufficient for reaction to occur.

4,390,515

METHOD AND APPARATUS FOR RECOVERING ELEMENTAL SULFUR

Arthur L. Vincent, Monrovia, Calif., assignor to International Telephone & Telegraph, New York, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,828

Int. Cl.³ C01B *17/02*

U.S. Cl. 423—573 G 5 Claims

1. Apparatus for recovering elemental sulfur, said apparatus comprising: a first source of a first gas including hydrogen sulfide (H_2S); a sulfur recovery plant having a combustion chamber, and a reaction chamber connected from said combustion chamber; an inlet conduit connected from said first source to said combustion chamber to deliver the entire flow of said first gas from said first source to said combustion chamber; a second source of a second gas including oxygen (O_2); detector means connected from said inlet conduit to produce an output signal proportional to the total mass flow rate m_b of H_2S in said inlet conduit; and source means connected from said detector means, said source means being responsive to said output signal to cause an oxygen mass flow rate m_a from said second source independent of all outputs of said reaction chamber, said mass flow rate m_a also being such that

$$m_a = 8m_b/17,$$

the combustion of said H_2S being incomplete in that said mass flow rate m_a as defined above is only one-third of the stoichiometric rate for complete combustion, said incomplete combustion resulting in a flow of H_2S through said combustion chamber, said reaction chamber being connected from said combustion chamber to receive said unburnt H_2S passing through said combustion chamber and to receive combustion products resulting from burning only a portion of said H_2S, burning of one-third H_2S taking place in said combustion chamber according to the equation

$$H_2S + 3/2O_2 \rightarrow SO_2 + H_2O,$$

where SO_2 is sulfur dioxide, and H_2O is water, reaction of said unburnt H_2S with said SO_2 taking place in said reaction chamber according to the equation

$$2H_2S + SO_2 \rightarrow 3S + 2H_2O,$$

where S is elemental sulfur.

4,390,516

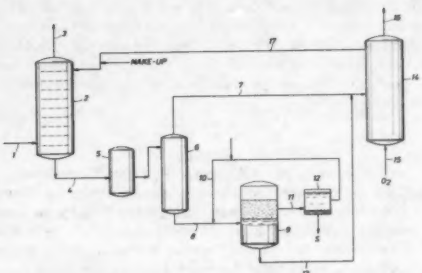
SULFUR SEPARATION PROCESS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 18, 1981, Ser. No. 322,486

Int. Cl.³ C01B *17/04;* B01D *53/34*

U.S. Cl. 423—573 R 12 Claims



1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the mixture comprising an effective amount of an oxidizing reactant selected from the group consisting of oxidizing polyvalent metallic ions and oxidizing polyvalent metal chelate compounds, and mixtures thereof, to produce a sweet gas stream and an aqueous admixture containing sulfur and reduced reactant;

(b) removing aqueous admixture from the contacting zone;

(c) separating removed aqueous admixture into an aqueous reactant solution having reduced sulfur content and an aqueous reactant slurry containing increased sulfur content; and regenerating aqueous reactant solution having reduced sulfur content producing regenerated reaction solution, and returning regenerated reaction solution to the contacting zone;

(d) concomitantly contacting aqueous reactant slurry in an extraction zone with a composition selected from compounds having the formula $C_nH_{2n+1}OH$, wherein n is a number from 4 through 18, and mixtures thereof, in an amount sufficient to remove at least the bulk of the sulfur from said slurry and form a separate phase containing sulfur and said composition, and forming a three phase mass comprising an upper phase containing solid sulfur and said composition, and a lower phase in contact with said upper phase, said lower phase comprising aqueous admixture containing reduced reactant;

(e) separating at least a portion of the upper phase, and recovering sulfur from the portion separated;

(f) separating aqueous admixture containing reduced reactant from the lower phase, and regenerating said separated aqueous admixture in a regeneration zone to produce an aqueous admixture containing a regenerated reactant;

(g) returning aqueous admixture from the regeneration zone to the contacting zone.

4,390,517

METHOD, COMPOSITION AND KIT FOR STABILIZING RADIOLABELED COMPOUNDS

Robert E. O'Brien, Belmont, and Nathan R. Tzodikov, Milton, both of Mass., assignors to New England Nuclear Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 105,272, Dec. 19, 1979. This application Aug. 15, 1980, Ser. No. 178,609

Int. Cl.³ A61K *43/00, 49/00;* B65D *71/00*

U.S. Cl. 424—1 35 Claims

14. A method of stabilizing a solution of a radiolabeled organic compound that is subject to radiolytic degradation against such degradation during storage and shipment, of said radiolabeled organic compound, said method comprising adding to said solution a stabilizing compound, which is not radiolabeled, selected from a water soluble amine having at least one alpha hydrogen on a carbon atom adjacent a nitrogen atom selected from the group consisting of:

(a) RNH_2,

(b) $RR^1{}_{NH}$,

(c) RR^1R^2N, and

(d) $R^3R^4N—R—NR^3R^4$,

or quaternized salts thereof, wherein:

R, R^1 and R^2 are the same or different and are alkyl, cycloalkyl, alkenyl, hydroxyalkyl, aminoalkyl, thioalkyl, carboxyalkyl or keto alkyl of one to eight carbon atoms, or R and R^1 of RR^1NH are combined to form a chain of four to six carbon atoms attached at each end to N, or one of the carbon atoms of the chain may be replaced by O or N; and

R^3 and R^4 are the same or different and are hydrogen or R, R^1, or R^2; wherein the stabilizing compound is not the unlabeled form of the radiolabeled compound;

with the proviso that when said stabilizing compound is ethylene diaminetetraacetic acid, a second stabilizing compound is added to said solution.

4,390,518

METHOD FOR THE DETERMINATION OF LEUKEMIC CELLS

Wolfgang Fischer, Darmstadt, and Renate Link, Reinheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,723

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014563

Int. Cl.³ G01N *1/30*

U.S. Cl. 424—3 6 Claims

1. A supravital method for the detection and for the differential diagnostic determination of leukemic cells in a sample of leucocytes, comprising treating the leucocytes with a supravital dye, the dye being a phthalein or sulphophthalein triphenylmethane dye and evaluating the resultant different staining of healthy and leukemic cells, the healthy cells remaining colorless, while the leukemic cells are stained.

4,390,519

BANDAGE WITH HEMOSTATIC AGENT AND METHODS FOR PREPARING AND EMPLOYING THE SAME

Philip N. Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

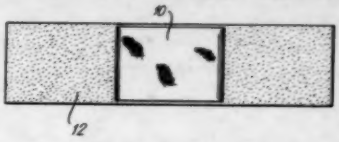
Continuation-in-part of Ser. No. 171,191, Jul. 22, 1980, which is a continuation-in-part of Ser. No. 907,899, May 19, 1978, Pat. No. 4,238,480. This application Sep. 2, 1980, Ser. No. 182,969

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ A61L *15/00*

U.S. Cl. 424—28 6 Claims

1. A method comprising modifying one of the group consisting of a water soluble collagen substance or a water soluble collagen-like substance by dissolving the substance in water and modifying the thusly dissolved substance to render the surface charge thereof effectively more positive than prior to modification while retaining the water solubility of the substance, and freezing and drying the thusly modified substance in a bandage.



4,390,520

ANTIPHLOGISTIC ANALGESIC ADHESIVE

Hidetaka Nagai, Hachioji; Yasushi Wada, Tachikawa; Ichiro Kobayashi, Osaka; Mitsuru Tamada, Osaka; Keiichi Ushiyama, Osaka, and Toshiyuki Yamamoto, Osaka, all of Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaki and Kawa Co., Ltd., Aichi, both of, Japan

Filed Mar. 30, 1981, Ser. No. 248,912

Claims priority, application Japan, Oct. 30, 1980, 55-153407

Int. Cl.³ A61F *13/00;* A61K *9/70;* A61L *15/00*

U.S. Cl. 424—28 13 Claims

1. An antiphlogistic analgesic adhesive which comprises a flexible polymer substrate and

an indomethacin containing pressure-sensitive adhesive layer closely contacting said flexible substrate, wherein said pressure-sensitive adhesive layer comprises a mixture of

(a) indomethacin in an amount of about 5–100 mg per gram of a copolymer, where the copolymer is,

(b) a copolymer of (i) an alkyl acrylate having 4 to 11 carbon atoms in the alkyl moiety and (ii) a functional monomer having a functional group in the molecule thereof and/or a vinyl monomer, which has pressure-sensitive adhesive properties at room temperature, said copolymer having an average molecular weight of about 20,000 to 500,000, and

(c) an absorption accelerating assistant consisting of an aliphatic acid ester and polyoxyethylene glycol polyhydric alcohols, which has a solubility parameter (SP) of 11 or less and has skin diffusibility.

4,390,521

ARTIFICIAL RED CELLS

Thomas A. Davis, Scotch Plains, and William J. Asher, Fanwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 11, 1980, Ser. No. 139,479

Int. Cl.³ A01N *25/28;* A61K *9/50, 9/64;* B01J *13/02*

U.S. Cl. 424—36 13 Claims

1. Artificial red cells comprising microdroplets of hemoglobin solution encapsulated in membranes of polymerized hemoglobin, wherein said hemoglobin has been polymerized with a water soluble cross-linking agent.

4,390,522

COSMETIC AGENTS BASED ON CATIONIC POLYMERS, COSMETIC COMPOSITIONS CONTAINING THE SAME AND THE USE OF SAID COSMETIC AGENTS

Bernard Jacquet, Antony; Gerard Lang, Epinay-sur-Seine; Alain Malaval, Aulnay sous Bois; Serge Forestier, Claye Souilly, and Do Le Trung, Drancy, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 17, 1980, Ser. No. 217,401

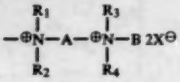
Claims priority, application France, Dec. 21, 1979, 79 31429

Int. Cl.³ A61K *7/00, 7/04, 7/06, 7/09*

U.S. Cl. 424—45 36 Claims

1. A cosmetic composition for application to the hair, skin or nails comprising in a cosmetic vehicle selected from the group

consisting of water, a lower alkanol and a dilute lower alkanol solution, 0.01 to 15 percent by weight of said composition of a cationic polymer having units of the formula



and having a molecular weight between 1,000 and 50,000, wherein

R_1, R_2, R_3 and R_4 each independently represent alkyl or hydroxyalkyl, wherein the alkyl of each has 1–20 carbon atoms,

A is alkylene, hydroxyalkylene, $-(CH_2)_n-Z-(CH_2)_n-$ wherein Z is oxygen and n is a whole number ranging from 2 to 10, or $-EO)_{m1}(DO)_mD$ wherein E represents alkylene or hydroxyalkylene containing 1–10 carbon atoms, D represents a bivalent hydrocarbon containing 1 to 5 carbon atoms, m_1 represents O or 1, m represents 1–600 with the proviso that m is greater than 1 when $m_1=O$, D_1 represents E when $m_1=1$, and D_1 represents D when $m_1=O$,

B represents $-EO_{m1}(DO)_mD_1$, wherein E, D, D_1, m and m_1 are defined above, and

$X^{\ominus}$ represents a halide anion.

4,390,523

SORBOSE FOR INHIBITING FERMENTATION ACIDS IN THE MOUTH

Michel Huchette, and Patrick Leroy, both of Lestrem, France, assignors to Roquette Freres, France

Continuation of Ser. No. 838,833, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 678,236, Apr. 19, 1976, abandoned, which is a continuation of Ser. No. 534,558, Dec. 19, 1974, abandoned, which is a continuation of Ser. No. 400,017, Sep. 24, 1973, abandoned. This application Jan. 4, 1980, Ser. No. 109,512

Claims priority, application France, Sep. 26, 1972, 72.34057

Int. Cl.³ A61K *9/68, 31/70*

U.S. Cl. 424—48 **1 Claim**

1. In a method of inhibiting the production of fermentation acids in the mouth and the subsequent lowering of the pH to 5.0 to 5.5 that occurs during use of chewing gum by the fermentation of oral bacteria of sucrose contained in said chewing gum as a sweetening agent, the improvement comprising substituting sorbose for said sucrose.

4,390,524

MAKEUP COMPOSITIONS IN CAKE FORM INCLUDING FIBROIN-COATED AND OILY MATERIAL-COATED PIGMENTS

Toshihiro Nasuno, Odawara, and Kiyoshi Otoi, Nagano, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,803

Claims priority, application Japan, Mar. 15, 1980, 55-33302

Int. Cl.³ A61K *7/02, 7/021, 7/025, 7/035*

U.S. Cl. 424—63 **19 Claims**

1. A cosmetic makeup composition consisting essentially of a homogenous mixture of from 10 to 90% by weight of finely divided, fibroin-coated, pigment particles and finely divided, oily material-coated, pigment particles, said fibroin-coated, pigment particles consisting essentially of first carrier pigment particles each substantially uniformly coated with a film of regenerated fibroin wherein the amount of said regenerated fibroin is from 2 to 100% by weight based on the weight of said first carrier pigment particles, at least 50% by weight of said regenerated fibroin consisting of hot-water-insoluble fibroin having the β-configuration, and said oily material-coated, pigment particles consisting essentially of second carrier pigment particles the surfaces of which are substantially uniformly coated with substantially water-insoluble, oily material suitable for use in cosmetics, the amount of said oily material being from 10 to 15% by weig[illegible] based on the weight of said second carrier pigment particles, said composition being in the form of a compressed cake.

4,390,525

KERATIN HYDROLYZATE USEFUL AS HAIR FIXATIVES

Issei Yoshioka, Hirakata, and Yoichi Kamimura, Osaka, both of Japan, assignors to Seiwa Kasei Co., Ltd., Higashi, Japan

Division of Ser. No. 78,850, Sep. 25, 1979, Pat. No. 4,279,996. This application Jan. 6, 1981, Ser. No. 222,381

Claims priority, application Japan, Oct. 9, 1978, 53-124289; Dec. 1, 1978, 53-149279; Dec. 29, 1978, 53-163085

Int. Cl.³ A61K *7/09, 47/00, 7/11*

U.S. Cl. 424—71 **4 Claims**

1. An aqueous cosmetic composition intended for application to the hair containing a water-soluble enzymatic hydrolysis product of reduced keratin prepared by reducing keratin in an aqueous solution of a reducing agent selected from the group consisting of mercaptan and sulfides under alkaline conditions, removing the reducing agent from the resulting reduction product and then subjecting the reduction product to enzymatic hydrolysis in an aqueous medium in the presence of an enzyme capable of hydrolyzing protein, to give a water-soluble enzymatic hydrolysis product of reduced keratin having at least two mercapto groups in one molecule and having an average molecular weight of 2,000 to 20,000.

4,390,526

PHARMACEUTICAL AGENTS FOR THE TREATMENT OF SICKLE CELL DISEASE

Marian Gorecki; Clemenceau T. A. Acquaye; Meir Wilchek, all of Rehovot, Israel, and Alexander Rich, Cambridge, Mass., assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

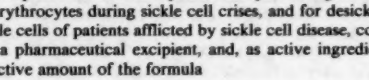
Filed Jun. 6, 1980, Ser. No. 157,107

Claims priority, application Israel, Jun. 21, 1979, 57609

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 **5 Claims**

1. A pharmaceutical composition for preventing the sickling of erythrocytes during sickle cell crises, and for desickling of sickle cells of patients afflicted by sickle cell disease, comprising a pharmaceutical excipient, and, as active ingredient, an effective amount of the formula



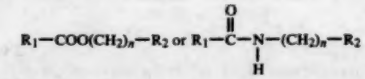
wherein

R_1 is a residue selected from the group consisting of naturally occurring and modified amino acids and from peptides containing said amino acids;

n is an integer of 1 to 5; and

R_2 is selected from the group consisting of unsubstituted thienyl, morpholine, pyridine, and pyrrolidone rings.

3. A method for preventing the sickling of erythrocytes during sickle cell crises, and for desickling of sickle cells of patients afflicted by sickle cell disease, comprising administering to such patients an effective amount of a compound of the formula



wherein

R_1 is a residue selected from the group consisting of natu-

rally occurring and modified amino acids and from peptides containing said amino acids;

n is an integer of 1 to 5; and

R_2 is selected from the group consisting of unsubstituted or para-nitro substituted phenyl, thienyl, morpholine, pyridine and pyrrolidone rings.

4,390,527

PHARMACOLOGICALLY ACTIVE PEPTIDES AND MEDICAMENTS CONTAINING THE SAME

Victor Brantl, Frauenplatz 10, 8000 München 2; Agnes Henschen, Am Klopferspitz, 8033 Martinsried; Hansjörg Teschemacher, Frankfurterstrasse 107, 6300 Giessen, and Friedrich Lottspeich, Am Klopferspitz, 8033 Martinsried, all of Fed. Rep. of Germany

PCT No. PCT/DE80/00126, § 371 Date Apr. 29, 1981, § 102(e) Date Apr. 29, 1981, PCT Pub. No. WO81/00712, PCT Pub. Date Mar. 19, 1981

Continuation-in-part of Ser. No. 229,577, Jan. 22, 1981. This PCT application Sep. 4, 1980, Ser. No. 258,617

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936099

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **7 Claims**

1. Pharmacologically active peptides of the following formulas:

Tyr¹-X-A,

Tyr¹X-A-Pro,

Tyr¹-X-A-Pro-B,

Tyr¹-X-A-Pro-B-Pro,

Tyr¹-X-A-Pro-B-Pro-C,

Tyr¹-X-A-Pro-B-Pro-C-Pro and

Tyr¹-X-A-Pro-B-Pro-C-Pro-D

wherein X represents D-proline, D-alanine, D-threonine or D-valine; A represents phenylalanine, proline and tyrosine B represents L-glycine, proline and tyrosine, C represents L-isoleucine and D represents L-asparagine, proline and isoleucine.

4,390,528

TUFTSINYL-TUFTSIN

Victor A. Najjar, Cohasset, Mass., assignor to Research Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,786

Int. Cl.³ A61K *37/02*; C07C *103/52*

U.S. Cl. 424—177 **12 Claims**

1. Therapeutically useful non-antigenic polypeptides selected from the group consisting of:

L-Thr-L-Lys-L-Pro-L-Arg-L-Thr-L-Lys-L-Pro-L-Arg,

D-Thr-L-Lys-L-Pro-D-Arg-D-Thr-L-Lys-L-Pro-D-Arg,

D-Thr-L-Lys-L-Pro-L-Arg-L-Thr-L-Lys-L-Pro-D-Arg

and pharmacologically acceptable salts and derivatives thereof.

4,390,529

S-(TERTIARY ALKYL) ALKYLPHOSPHONOAMIDODITHIOATES AND THEIR USE AS INSECTICIDES AND NEMATOCIDES

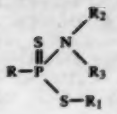
Mohamed A. Fahmy, Princeton, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Dec. 31, 1980, Ser. No. 221,647

Int. Cl.³ A01N *57/28*; C07F *9/24*

U.S. Cl. 424—220 **26 Claims**

1. A method for controlling insects or nematodes which comprises applying thereto or to their habitat, in an amount pesticidal to said insects or nematodes, a compound of the formula



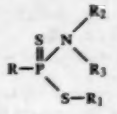
in which

R is alkyl of 1 to 8 carbon atoms, haloalkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, haloalkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, or haloalkynyl of 2 to 8 carbon atoms;

R_1 is tertiary alkyl of 4 to 8 carbon atoms; and

R_2 and R_3, independently, are hydrogen, alkyl of 1 to 8 carbon atoms, cyclopentyl or cyclohexyl.

7. A compound of the formula



in which

R is alkyl of 1 to 8 carbon atoms, haloalkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, haloalkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, or haloalkynyl of 2 to 8 carbon atoms;

R_1 is tertiary alkyl of 4 to 8 carbon atoms; and

R_2 and R_3, independently are hydrogen, alkyl of 1 to 8 carbon atoms, cyclopentyl or cyclohexyl.

4,390,530

3-DEOXY-Δ^{15}-STEROIDS

Helmut Hofmeister; Rudolf Wiechert; Klaus Annen; Henry Laurent, and Sybille Beier, all of Berlin, Fed. Rep. of Germany, assignors to Schering, A.G., Berlin, Fed. Rep. of Germany

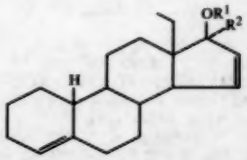
Filed Feb. 11, 1981, Ser. No. 233,350

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3005374

Int. Cl.³ A61K *31/56*; C07J *11/00, 17/00*

U.S. Cl. 424—238 **12 Claims**

1. A 3-deoxy-Δ^{15}-steroid of the formula



wherein

R^1 is hydrogen or an acyl group of a C_{1-15} hydrocarbon carboxylic acid, and

R^2 is ethynyl, chloroethynyl or propynyl.

12. A method of achieving contraceptive effects in a patient in need of the same comprising administering a progestationally effective amount of a compound of claim 1.

4,390,531
METHOD OF CONTRACEPTION USING PEAK PROGESTOGEN DOSAGE

Richard A. Edgren, Woodside, Calif., assignor to Syntex Pharmaceuticals International Ltd., Hamilton, Bermuda

Filed Aug. 10, 1981, Ser. No. 291,533
Int. Cl.³ A01N *45/00*; A61K *31/56*
U.S. Cl. 424—239 **9 Claims**

1. A method of contraception in the female human, which method comprises administering to a subject in need of, or desiring, such an effect, a daily sequence of unit dosages over a repeating cycle, which dosage sequence comprises, for one cycle:

(a) administering, as phase one, for a period of 5–8 days, daily dosages of a combination of an estrogen and a progestogen, wherein the amounts of estrogen and progestogen correspond in estrogenic activity to about 20–40 μg of ethinyl estradiol, and in progestogenic activity to about 0.3–0.8 mg of norethindrone, followed by:

(b) administering, as phase two, for a period of 7–11 days, the same dosage of estrogen and twice the dosage of progestogen each day as was administered in phase 1, followed by:

(c) administering, as phase three, for a period of 3–7 days, the same dosage of estrogen and the same dosage of progestogen each day as was administered each day in phase one, followed by;

(d) administering, as phase four, for a period of 6–8 days, no therapeutically active dosage, i.e. either no treatment or a placebo each day,

with the proviso that the total number of days in phases one through three is 21.

4,390,532
TOPICAL COMBINATIONS OF AN α-ESTRADIOL WITH A METHYL XANTHINE

Günter Stüttgen, and Hans Schaefer, both of Berlin, Fed. Rep. of Germany, assignors to Dr. Carl Hahn, G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 750,086, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 509,369, Sep. 26, 1974, abandoned. This application Mar. 8, 1978, Ser. No. 884,452
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1973, 2350315
Int. Cl.³ A61K *31/56, 31/70, 31/52*
U.S. Cl. 424—240 **12 Claims**

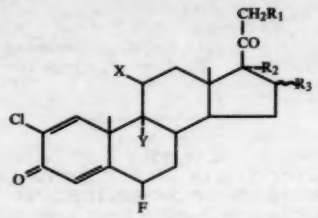
1. A method for treating a subject suffering from reversible androgen baldness which comprises topically applying to the baldness site of said subject a composition comprising effective combined amounts of an α-estradiol compound and a methyl xanthine compound.

4,390,533
STEROIDS AND PROCESS FOR PREPARING THE SAME

Mario Riva, and Luciano Toscano, both of Milan, Italy, assignors to Pierrel, S.p.A., Milan, Italy

Division of Ser. No. 24,460, Mar. 27, 1979, Pat. No. 4,275,061, which is a continuation of Ser. No. 839,881, Oct. 6, 1977, abandoned, which is a continuation of Ser. No. 596,266, Jul. 16, 1975, abandoned. This application Feb. 23, 1981, Ser. No. 237,509
Claims priority, application United Kingdom, Jun. 14, 1975, 25478/75
Int. Cl.³ A61K *31/56*; C07J *1/00*
U.S. Cl. 424—243 **35 Claims**

1. A compound having the formula:



(A)

wherein X is Br, Cl or OQ, Y is Br, Cl, F or H, R_1 is OQ, R_2 is OQ and R_3 is H, or αOQ, and Q, which may be the same or different, is H, or acyl radicals, or OQ in the 16,17 or in the 17,21 positions may together form a cyclic ketal, cyclic acetal or cyclic alkyl orthoester, and pharmaceutically acceptable salts and esters of those compounds wherein at least one radical Q is a polycarboxylic or an inorganic acid radical.

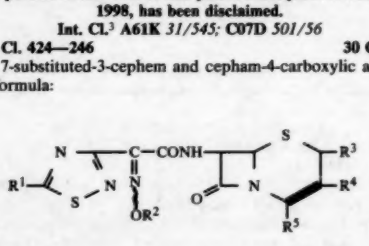
6. A method of combatting inflammation in a patient comprising applying a compound according to claim 1 to the patient topically or or systemically in a non-toxic pharmaceutically effective amount.

4,390,534
CEPHEM AND CEPHAM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 160,904, Jun. 18, 1980, which is a continuation-in-part of Ser. No. 128,260, Mar. 7, 1980, Pat. No. 4,331,665, which is a continuation-in-part of Ser. No. 116,984, Jan. 30, 1980, Pat. No. 4,332,798, which is a continuation-in-part of Ser. No. 108,161, Dec. 28, 1979, abandoned. This application Apr. 17, 1981, Ser. No. 255,301
Claims priority, application United Kingdom, Dec. 29, 1978, 50334/78; Oct. 12, 1979, 7935538; South Africa, Oct. 1, 1980, 80/6068
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ A61K *31/545*; C07D *501/56*
U.S. Cl. 424—246 **30 Claims**

1. 7-substituted-3-cephem and cepham-4-carboxylic acid of the formula:



where

R^1 is amino or a protected amino;

R^2 is hydrogen, lower alkylthio(lower)alkyl, halo(lower)alkyl, ar(lower)alkyl, lower alkenyl, lower alkynyl, cyclo(lower)alkyl, cyclo(lower)alkenyl, or O containing 5-membered heterocyclic group substituted with an oxo group;

R^3 is hydrogen;

R^4 is pyridinium(lower)alkyl or pyridinium(lower)alkyl substituted with carbamoyl; and

R^5 is COO^-; or

R^4 is lower alkanoyl(lower)alkanoyloxy(lower)alkyl or 2-lower alkyl-5-oxo-6-hydroxy-2,5-dihydro-1,2,4-triazinylthio(lower)alkyl; and R^5 is carboxy or protected carboxy; and the heavy solid line means single or double bond; and pharmaceutically acceptable salt thereof.

30. An antibacterial composition comprising an effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,390,535

ANTIMICROBIAL 7-(α-ACYLAMINO-α-ARYLACETAMIDO)-3-(SUBSTITUTED METHYL)CEPHALOSPORIN COMPOUNDS

Hirotada Yamada, Nishinomiya; Kiyokazu Jimpo, Moriguchi; Takao Okuda, Toyonaka; Hiroshi Noguchi, Ashiya, and Hisao Tobiki, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

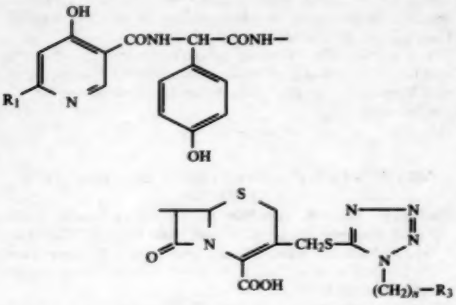
Filed Mar. 5, 1981, Ser. No. 240,666

Claims priority, application Japan, Mar. 5, 1980, 55-28536; Mar. 5, 1980, 55-28537

Int. Cl.³ A61K *31/545*; C07D *501/56*

U.S. Cl. 424—246 **3 Claims**

1. A compound of the formula



wherein R_1 is a methyl group, R_3 is a carboxyl group, and n is an integer of 1 to 4 and the pharmaceutically acceptable non-toxic salts thereof.

3. An antimicrobial composition comprising an antimicrobially effective amount of the compound of claim **1**, and a carrier or diluent.

4,390,536

PIPERIDINE DERIVATIVES

Masayuki Teranishi; Hiroyuki Obase, both of Machida; Haruki Takai, Kawasaki, all of Japan; Kazahiro Kubo, Berchem, Belgium, and Yutaka Kasuya, Komukainishi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

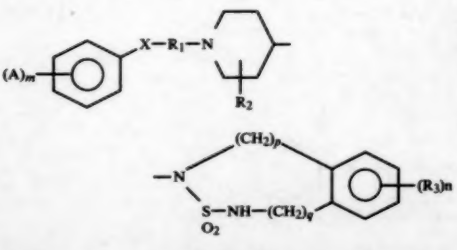
Division of Ser. No. 241,727, Mar. 9, 1981, Pat. No. 4,344,945. This application Feb. 26, 1982, Ser. No. 352,762

Claims priority, application Japan, Mar. 10, 1980, 55-29106; May 27, 1980, 55-69619

Int. Cl.³ C07D *417/04*; A61K *31/54*

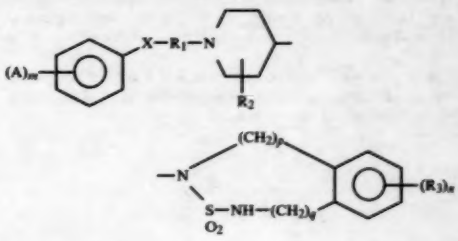
U.S. Cl. 424—246 **7 Claims**

1. A compound represented by the formula:



wherein A is hydroxy, halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, carboxy, lower alkoxycarbonyl, nitro, amino, lower alkylamino, lower alkanoylamino, sulfamoyl, mono- or di-lower alkylaminosulfonyl, lower alkylsulfonyl, carbamoyl, cyano or trifluoromethyl, m is 0 or an integer of 1–5, and when m is 2 or more, each A is the same group or each A is a different group or two A groups may combine to form lower alkylenedioxy; X is oxygen, sulfur, carbonyl, hydroxymethylene or methylene; R_1 is straight-chain alkylene having 1–4 carbon atoms with or without lower alkyl substituent(s); R_2 is hydrogen or lower alkyl; p and q are 0 or 1 and when p is 1, q is 0 and when p is 0, q is 1; and R_3 is hydroxy, lower alkoxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro or amino, n is 0 or an integer of 1–4, and when n is 2 or more, each R_3 is the same group or each R_3 is a different group or two R_3 groups may combine to form lower alkylenedioxy and a pharmacologically acceptable acid addition salt thereof.

7. A hypotensive composition which comprises at least one pharmaceutically acceptable carrier, and an effective amount of a compound represented by the formula:



wherein A is hydroxy, halogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, carboxy, lower alkoxycarbonyl, nitro, amino, lower alkylamino, lower alkanoylamino, sulfamoyl, mono-or di-lower alkylaminosulfonyl, lower alkylsulfonyl, carbamoyl, cyano or trifluoromethyl, m is 0 or an integer of 1–5, and when m is 2 or more, each A is the same group or each A is a different group or two A groups may combine to form lower alkylenedioxy; X is oxygen, sulfur, carbonyl, hydroxymethylene or methylene; R_1 is straight-chain alkylene having 1–4 carbon atoms with or without lower alkyl substituent(s); R_2 is hydrogen or lower alkyl; p and q are 0 or 1 and when p is 1, q is 0 and when p is 0, q is 1; and R_3 is hydroxy, lower alkoxy, halogen, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro or amino, n is 0 or an integer of 1–4, and when n is 2 or more, each R_3 is the same group or each R_3 is a different group or two R_3 groups may combine to form lower alkylenedioxy or a pharmacologically acceptable acid addition salt thereof.

4,390,537

1-(SUBSTITUTED-AMINOALKOXYPHENYL)-2-METHYLENE-1-ALKANONES, COMPOSITIONS AND USE

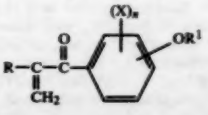
Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 961,422, Nov. 16, 1978, Pat. No. 4,342,782. This application May 19, 1982, Ser. No. 379,604

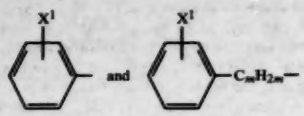
Int. Cl.³ C07D *295/10*; A61K *31/535*

U.S. Cl. 424—248.58 **7 Claims**

1. A compound of the general formula:

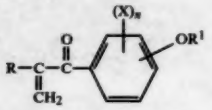


wherein R is lower alkyl, trihalomethyl substituted lower alkyl, cycloalkyl containing from 3 to 6 carbon atoms or the radicals

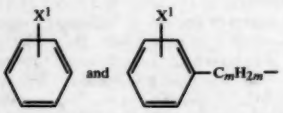


in which X^1 is hydrogen, halogen or lower alkyl and m is an integer from 1 to 5; X is hydrogen, lower alkyl, halogen or when taken together two X radicals on adjacent carbon atoms of the benzene ring to which they are attached may be joined to form the 1,3-butadienylene linkage; n is an integer from 1 to 4; and R^1 is N-alkyl substituted five-membered saturated heterocycles containing one N atom; N-alkyl substituted six-membered saturated heterocyles containing one N atom; N-alkyl substituted six-membered saturated heterocycles containing one O atom and one N atom; or nitrogen containing heterocyclicmethyl and their pharmaceutically acceptable acid addition salts.

4. A pharmaceutical composition useful in treating patients having allergic conditions which comprises as an active ingredient a compound of the formula:



wherein R is lower alkyl, trihalomethyl substituted lower alkyl, cycloalkyl containing from 3 to 6 carbon atoms, or the radicals



in which X^1 is hydrogen, halogen or lower alkyl and m is an integer from 1 to 5; X is hydrogen, lower alkyl, halogen or when taken together two X radicals on adjacent carbon atoms of the benzene ring to which they are attached may be joined to form the 1,3-butadienylene linkage; n is an integer from 1 to 4; and R^1 is N-alkyl substituted five-membered saturated heterocycles containing one N atom, N-alkyl substituted six-membered saturated heterocycles containing one N atom, N-alkyl substituted six-membered saturated heterocycles containing one O atom and one N atom, nitrogen containing heterocyclicmethyl and their pharmaceutically acceptable acid addition salts in association with a carrier.

4,390,538

PESTICIDAL TRIORGANO-TIN TRIAZINES

Wolfgang Wehner, Zwingenberg, Fed. Rep. of Germany; Saleem Farooq, Ettingen, Switzerland, and Hans-Günter Köstler, Heppenheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,884

Claims priority, application Switzerland, Sep. 12, 1980, 6882/80

Int. Cl.³ C07D *251/52, 251/34, 251/38;* A01N *43/70*

U.S. Cl. 424—249 **12 Claims**

1. A triorgano-tin triazine compound of the formula

(I)

wherein X' is —S—Y—COOSn(R')$_3$, —O—Y—COOSn(R')$_3$ or —NH—Y—COOSn(R')$_3$, each of X'' and X''' has the same meaning as X' or is halogen, $(C_1$–C_6alkyl$)_2$N—, (C_1–C_6alkyl)—NH—, (C_1–C_6alkyl)—O— or (C_1–C_6alkyl)—S—, Y is C_1–C_6alkylene, and the radicals R' can be the same or different and are C_1–C_6alkyl, benzyl, phenyl or cyclohexyl, each of which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy or trifluoromethyl.

9. A method of controlling insects, fungi or acarids harmful to animals or plants at a locus, which comprises applying to said locus a specifically effective amount of a compound according to claim 1.

4,390,539

METHOD FOR THE TREATMENT OF VIRAL SKIN DISEASES

George F. Sherrill, 405-39th St., Newport Beach, Calif. 92663, assignor to George F. and Irene Sherrill 1978 Trust No. 1, Newport Beach, Calif. and George F. and Irene Sherrill 1978 Trust No. 2, Newport Beach, Calif., a part interest in each

Division of Ser. No. 29,698, Apr. 13, 1979, Pat. No. 4,267,007, which is a continuation of Ser. No. 781,170, Mar. 25, 1977, abandoned. This application Feb. 2, 1981, Ser. No. 230,545

Int. Cl.³ A61K *31/505, 31/44, 31/40, 31/14*

U.S. Cl. 424—251 **18 Claims**

1. A method for the treatment in humans of viral skin diseases susceptible to topical treatment comprising the topical application to infected areas of a person of an amount of a composition effective to treat said viral skin diseases wherein the composition comprises an effective amount of at least 0.1% captan and an effective amount of surface active quaternary ammonimum salt salt bactericide.

4,390,540

IMIDAZOQUINAZOLINES HAVING PHARMACEUTICAL ACTIVITY

Madhukar S. Chodnekar, Seltisberg; Ado Kaiser, Lausen, and Frank Kienzle, Flüh, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

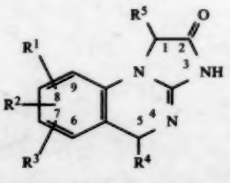
Filed Aug. 12, 1981, Ser. No. 292,315

Claims priority, application Switzerland, Aug. 15, 1980, 6192/80; May 27, 1981, 3483/81

Int. Cl.³ A61K *31/505;* C07D *487/04*

U.S. Cl. 424—251 **12 Claims**

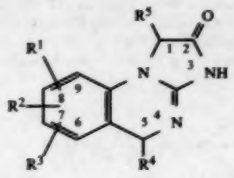
1. A compound of the formula



I

wherein R^1, R^2 and R^3 are hydrogen, halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_{2-5}-alkoxyalkyl; or two of R^1, R^2 and R^3 on adjacent carbon atoms together are methylenedioxy or ethylenedioxy; and R^4 and R^5 are hydrogen or C_{1-4}-alkyl, its tautomers, as well as its pharmaceutically acceptable acid addition salts.

10. A method of inhibiting blood platelet aggregation which comprises administering an effective amount of a compound of the formula



I

wherein R^1, R^2 and R^3 are hydrogen, halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_{2-5}-alkoxyalkyl; or two of R^1, R^2 and R^3 on adjacent carbon atoms together are methylenedioxy or ethylenedioxy; and R^4 and R^5 are hydrogen or C_{1-4}-alkyl.

4,390,541

QUINOLONE DERIVATIVES AND THEIR USE IN A METHOD OF CONTROLLING AN IMMEDIATE HYPERSENSITIVITY DISEASE

John Goldsworthy, North Ascot; William J. Ross, Lightwater, and John P. Verge, Henley-on-Thames, all of England, assignors to Lilly Industries Limited, London, England

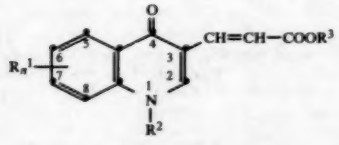
Filed Dec. 3, 1981, Ser. No. 327,146

Claims priority, application United Kingdom, Dec. 19, 1980, 8040732

Int. Cl.³ A61K *31/47*; C07D *215/22*

U.S. Cl. 424—258 6 Claims

1. A compound of formula



(I)

in which n is 0,1 or 2, R^1 is C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphonyl, trifluoromethyl, halo or nitro, and R^2 and R^3 are each independently hydrogen or C_{1-4} alkyl, and salts thereof.

6. A method of controlling an immediate hypersensitivity disease in an animal, including a human, which comprises administering to the animal a therapeutically effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable salt thereof.

4,390,542

METHOD FOR INHIBITING CONTRACTION OF OPTHALMIC WOUNDS OR INCISIONS

Ronald A. Schachar, P.O. Box 145, Denison, Tex. 75020

Filed Dec. 2, 1980, Ser. No. 212,315

Int. Cl.³ A61K *31/485*, *31/52*, *31/445*, *31/365*

U.S. Cl. 424—260 7 Claims

1. A method for inhibiting contraction of an ophthalmic wound or incision which comprises administering to said wound or incision a pharmaceutically acceptable composition comprising an ophthalmological carrier and an effective amount of smooth muscle relaxant to inhibit the contraction of myofibroblasts present in the wound or incision.

4,390,543

SUBSTITUTED PYRIDINE METHYL ESTERS OF 2-ISOPROPYL-2-(4-CHLOROPHENYL) ACETIC ACID AND THEIR USE AS INSECTICIDES

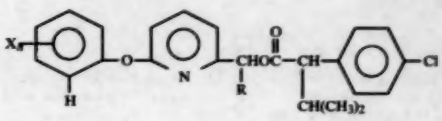
Sudarshan K. Malhotra, 2416 Belford Dr., Walnut Creek, Calif. 94598, and John C. Van Heertum, 5452 Anselmo Ct., Concord, Calif. 94521

Division of Ser. No. 62,453, Jul. 30, 1979, Pat. No. 4,228,172. This application Apr. 21, 1980, Ser. No. 142,181

Int. Cl.³ C07D *213/55*, *213/57*; A01N *43/40*

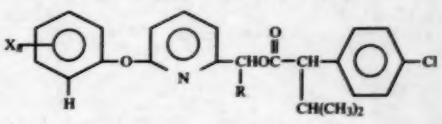
U.S. Cl. 424—263 12 Claims

1. A compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents nitro or cyano; and R represents hydrogen, cyano or ethynyl.

9. The method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing an inert carrier and as the active ingredient, an insecticidally effective amount of a compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents nitro or cyano and R represents hydrogen, cyano or ethynyl.

4,390,544

{1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-(2-OXO-1-BENZIMIDAZOLINYL} PIPERIDINES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

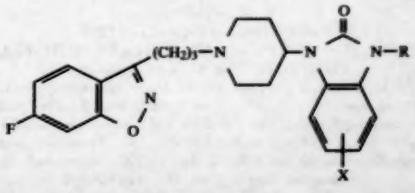
Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 9, 1982, Ser. No. 366,244

Int. Cl.³ A61K *31/445*; C07D *413/14*

U.S. Cl. 424—267 9 Claims

1. A compound of the formula



wherein R is hydrogen or loweralkyl; X is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipodes thereof, or pharmaceutically acceptable acid addition salts thereof.

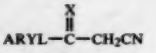
4. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain alleviating effective amount of a compound as defined in claim 1.

4,390,545
COMBINATIONS OF AGENTS WHICH GIVE ENHANCED ANTI-INFLAMMATORY ACTIVITY

Adolph E. Sloboda, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 322,789, Nov. 19, 1981, Pat. No. 4,350,689. This application Jul. 6, 1982, Ser. No. 395,409
Int. Cl.³ A61K *31/38*
U.S. Cl. 424—275 **8 Claims**

1. An anti-inflammatory composition of matter comprising, in additive combination, a mixture of γ-oxo-(1,1'-biphenyl)-4-butanoic acid and an anti-arthritic agent of the formula



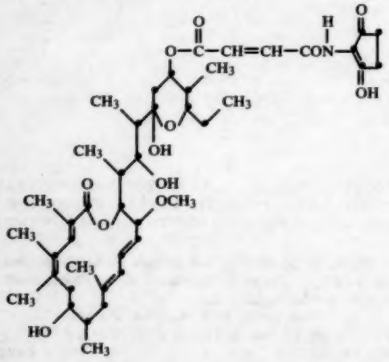
wherein X is oxo or imino and ARYL is 2-thienyl or 3-thienyl in the proportion of the γ-oxo-(1,1'-biphenyl)-4-butanoic acid to the anti-arthritic agent of from 100:1 to 1:100 parts by weight.

4,390,546
ANTIPARASITIC MACROLIDE FROM A STRAIN OF *STREPTOMYCES HYGROSCOPICUS*

Michael A. Goetz, North Plainfield; Pamela A. McCormick, Willingboro, and Richard L. Monaghan, Somerset, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 7, 1981, Ser. No. 327,838
Int. Cl.³ C07D *313/00*; A61K *31/365*
U.S. Cl. 424—279 **5 Claims**

1. A compound having the formula:

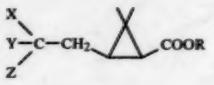


4,390,547
2,2-DIMETHYL-3-(SUBSTITUTED ETHYL)CYCLOPROPANE CARBOXYLATE PESTICIDAL COMPOSITIONS AND METHODS

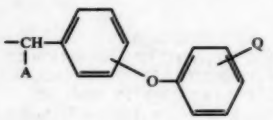
Yoshiaki Omura, Okayama; Fumio Mori, Kurashiki; Yoshiji Fujita, Kurashiki; Takashi Nishida, Kurashiki; Yoshin Tamai, Kurashiki; Fumio Wada, Fukuoka, and Kazuo Itoi, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 923,542, Jul. 11, 1978, abandoned. This application May 1, 1981, Ser. No. 259,507
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ A01N *53/00*
U.S. Cl. 424—304 **93 Claims**

1. A method for the control of agricultural and horticultural insects, forest insects, harvested crop insects, household insects, mites, and pests of the genera Tettigoniidae, Gryllidae, Gryllotalpidae, Blattidae, Reduviidae, Pyrrhocoridae, Cimicidae, Delphacidae, Aphididae, Diaspididae, Pseudococcidae, Scarabaeidae, Dermestidae, Coccinellidae, Tenebrionidae, Chrysomelidae, Bruchidae, Tineidae, Noctuidae, Lymantriidae, Pyralidae, Culicidae, Tipulidae, Stomoxydae, Trypetidae, Muscidae, Calliphoridae, Pulicidae, Tetranychidae and Dermanyssidae, which comprises applying to the habitat of such pests a pesticidally effective amount of a cyclopropanecarboxylate having the structural formula:

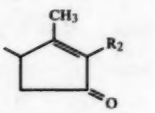


wherein X, Y and Z are the same or different and at least two of same are chlorine or bromine, with the remaining one being hydrogen, methyl, chlorine or bromine; R is a member selected from the group consisting of those of the structural formulae (1), (2) and (3):



(1)

(2)



(3)

where A is hydrogen, cyano, ethynyl or thiocarbamoyl; Q is hydrogen, chlorine, bromine, fluorine, methyl or trifluoromethyl; R^1 is 2-halogeno-3-phenyl-1-propen-1-yl, (dihalogenovinyloxy)phenyl or benzylphenyl; and R^2 is allyl, 2,4-pentadienyl, propargyl or benzyl.

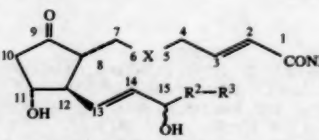
4,390,548
TRANS-Δ^2-PGE ALKYLSULPHONYL AMIDES

Takashi Yamato, Takatsuki; Hirofumi Endo, Fujinomiya; Kimiichiro Matsumoto, and Hajimu Miyake, both of Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,102
Claims priority, application Japan, Apr. 28, 1980, 55-55337
Int. Cl.³ C07C *143/75*; A61K *31/18*
U.S. Cl. 424—321 **11 Claims**

1. A prostaglandin analogue of the formula:

IV



(wherein R^1 represents an alkyl group containing from 1 to 4 carbon atoms, R^2 represents a single bond or an alkylene group containing from 1 to 5 carbon atoms, R^3 represents an alkyl group containing from 1 to 8 carbon atoms, X represents an ethylene group or a cis-vinylene group, the double bonds between the carbon atoms in positions 2 and 3 and between the carbon atoms in positions 13 and 14 are both in trans-configura-

tion, and the wavy line attached to the carbon atom in position 15 represents α- or β-configuration or a mixture thereof), or a cyclodextrin clathrate thereof.

11. A method for the termination of pregnancy or induction of labour in a pregnant female mammal or for contraception or menstrual regulation in a female mammal which comprises administering an effective amount of a compound of general formula IV specified in claim 1, or a cyclodextrin clathrate thereof.

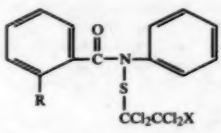
4,390,549

N-TETRACHLOROETHYLTHIO BENZOYL ANILIDES USEFUL AS ACARICIDES AND TO CONTROL MOSQUITOES

Hsiao-Ling M. Chin, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 25, 1981, Ser. No. 277,355
Int. Cl.³ A01N 37/00, 37/18
U.S. Cl. 424—324 5 Claims

1. A method of killing misquitoes comprising applying thereto an insecticidally effective amount of a compound having the formula



in which R is chlorine, hydrogen, or trifluoromethyl and X is hydrogen or fluorine.

4,390,550

INTERMEDIATE MOSITURE FROZEN FOODS

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Division of Ser. No. 24,128, Mar. 26, 1979, Pat. No. 4,234,611, which is a division of Ser. No. 917,379, Jun. 20, 1978, Pat. No. 4,199,604, which is a division of Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,154,863, which is a division of Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application May 21, 1980, Ser. No. 152,050
Int. Cl.³ A23B 7/08; A23L 1/164
U.S. Cl. 426—102 24 Claims

1. A method of infusing fruit with sugar solutes to reduce the water activity of said fruit which comprises the steps of:

(a) tretaing the fruit to create sites for the removal of a portion of said fruit's water content and substitution thereof by sugar solutes; followed by

(b) bathing the treated fruit in a sugar solutes-containing bath so as to induce infusion of the fruit with the sugar solutes, said bath comprising a fructose-containing corn syrup, comprising about 70 to about 80% sugar solids, wherein fructose comprises about 40 to about 90% of the total sugar content of said bath, said infused fruit having a water activity of about 0.45 to about 0.65; and

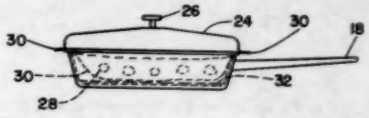
(c) incorporating said infused fruit in cereal without substantially raising the water activity of said cereal.

4,390,551

HEATING UTENSIL AND ASSOCIATED CIRCUIT COMPLETING POUCH

John S. Swartley, Westport, and Suren Der Avedisian, Norwalk, both of Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,764
Int. Cl.³ B65B 29/08; H05B 3/00; F27D 11/00; B65D 81/34
U.S. Cl. 426—107 1 Claim



1. The combination of an electrical kitchen utensil and a disposable pouch for use in said utensil, said combination comprising:

a. an electrical kitchen utensil, said utensil having;

i. a lower member having a substantially horizontal top rim for supporting said disposable pouch above a bottom of said utensil;

ii. a cover for said lower member, said cover defining an opening which matches the horizontal rim of said utensil, said cover cooperating with said rim to clamp a flange portion of the disposable pouch therebetween and suspend the pouch above the bottom of the utensil;

iii. an electrical heating means incorporated in said utensil for heating the interior of the utensil and the comestible product in said disposable pouch,

iv. a first electrical contact means arranged adjacent the rim of said lower member, said contact means interrupting an electrical circuit that energizes said heating means;

b. a disposable pouch without a heating element for use with said utensil, said pouch having:

i. a first and second layer of fluid impervious flexible material, said comestible product being packaged between said layers,

ii. a flange member extending outwardly on all sides of said pouch, said flange member having a larger perimeter than the perimeter of said utensil rim;

iii. a second electrical contact means positioned along one edge of the flange member said second contact means formed to bridge the first electrical contact means arranged adjacent the rim of the lower member to thereby close the electrical circuit and energize said heating means in the kitchen utensil.

4,390,552

HEAT-SEALING SHEET MATERIAL

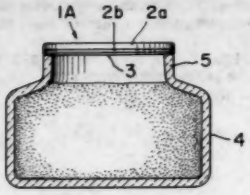
Susumu Niwa, Wako, Japan, assignor to Kabushiki Kaisha Hosokawa Yoko, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,704
Claims priority, application Japan, Apr. 18, 1981, 56-55997[U]
Int. Cl.³ B65D 85/00, 53/00; B32B 15/08, 27/00
U.S. Cl. 426—126 8 Claims

1. A heat-sealing sheet material which comprises a base sheet and a sealant layer formed on one side of the base sheet, said sealant being a graft copolymer comprising a trunk polymer of a 20 to 60% saponification product of an ethylene/vinyl acetate copolymer (EVA) of a vinyl acetate content of 15 to 45% by weight and a branch polymer of an unsaturated carboxylic acid in a proportion of 10% by weight or less of the graft-copolymer.

7. A sealed glass container which comprises a glass container containing a product and having an opening rim and a heat-sealing sheet material of claim 1 affixed on the opening rim of

said container with the sealant layer in heat-sealed contact with the opening rim.



8. A sealed glass container according to claim 7 wherein the product is a water-containing food product.

4,390,553

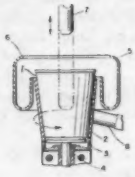
EDIBLE FOOD CONTAINERS AND THE METHOD OF COATING SAID CONTAINERS

Irving H. Rubenstein, and Herbert M. Bank, both of Owings Mills, Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 175,374, Aug. 5, 1980. This application May 12, 1981, Ser. No. 263,094

Int. Cl.³ A23L *1/10;* **A23G** *3/20;* **A21D** *15/08*

U.S. Cl. 426—138 **13 Claims**



1. A method of processing an edible food container for use with a food product which comprises applying a moisture-resistant, barrier coating composition of a food grade fat material to at least the interior surface of the edible food container in an amount sufficient to produce a continuous, uniform film of said barrier coating composition on said surface, said barrier coating composition being applied by introducing an effective amount of said coating composition into the edible food container and then forcing the coating composition up the inside surface of the container by imparting relative motion to the container and coating composition to effect a rotational motion of the coating composition within the container.

4,390,554

MICROWAVE HEATING OF CERTAIN FROZEN FOODS

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 927,397, Jul. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 713,235, Aug. 6, 1976, Pat. No. 4,103,431, which is a continuation-in-part of Ser. No. 572,385, Apr. 28, 1975, abandoned. This application Mar. 11, 1980, Ser. No. 129,360

Int. Cl.³ A23L *1/00;* **B65B** *29/08, 29/00*

U.S. Cl. 426—232 **17 Claims**

1. For use in a microwave oven, a food package which comprises:

a microwave-permeable, non-liquid-absorptive inner member for covering a food,

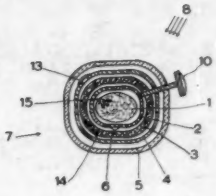
a plurality of openings, through said inner member, of sufficient size to permit liquid, food by-products to transfer across said inner member when said liquid, food by-products are in motion due to exposure of said food to microwave radiation and of sufficient size to prevent said transfer of said liquid, food by-products when said liquid, food by-products are not in motion due to exposure of said liquid, food by-products to microwave radiation,

a microwave-permeable, liquid-absorptive material in contact with, at least, a part of said inner member's ouside surface, and

an outer microwave-permeable, liquid-non-permeable, non-microwave-absorptive enclosure which forms a heating chamber and encloses said inner member and said liquid-absorptive material.

8. A method of defrosting and heating, in a microwave oven, a frozen food, the steps which include:

enclosing said food in an inner, microwave-permeable plastic film which film contains a plurality of openings of



sufficient size to permit the passage across said film of liquid-and-oil by-products of said food when under pressure due to exposing said food to microwave-radiation and of sufficient size to limit the passage across said film of said liquid-and-oil when said liquid-and-oil is not under said pressure due to said exposure to microwave radiation,

completely enclosing said food and said inner film in an outer microwave-permeable container fabricated to contain vapor, water and oil therein,

placing a water-and-oil-absorptive material between said inner film and said outer container, and

exposing said food to microwave radiation until said food defrosts and heats.

4,390,555

MICROWAVE OVEN COOKING METHOD

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J. 07001

Continuation-in-part of Ser. No. 129,360, Mar. 11, 1980, which is a continuation-in-part of Ser. No. 4,324, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,397, Jul. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 713,235, Aug. 10, 1976, Pat. No. 4,103,431. This application Jul. 28, 1980, Ser. No. 173,006

Int. Cl.³ A23L *1/00;* **B65B** *29/00, 29/08*

U.S. Cl. 426—234 **4 Claims**

1. In a method of defrosting and heating in a microwave oven a frozen food, the steps which include:

surface-defrosting-wetting said frozen food with water to create a positive surface-to-core differential in microwave lossiness in said food,

enclosing said food in an inner, microwave-permeable member which contains a plurality of openings of sufficient size to permit the passage across said member of liquid-and-oil by-products of said food when evolved from said food due to exposing said food to microwave energy and of sufficient size to limit the passage across said member of said liquid-and-oil when said liquid-and-oil is not exposed to microwave energy,

containing said food and said inner member in an outer

microwave-permeable container fabricated to contain water and oil therein, and

exposing said food to microwave radiation until said food defrosts and heats.

4,390,556

MICROBIOLOGICAL TRANSFORMATIONS OF ALPHA-IONONE

Victor Krasnobajew, Küsnacht, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 96,111, Nov. 20, 1979, Pat. No. 4,311,860. This application Aug. 28, 1981, Ser. No. 296,950

Int. Cl.³ A23L *1/226*; C12P *7/26, 7/02*

U.S. Cl. 426—538 9 Claims

1. A process for the manufacture of an odorant and/or flavoring composition which comprises fermenting α-ionone with a fungus selected from the group consisting of the genera Botryodiplodia, Botryosphaeria and Lasiodiplodia under aerobic conditions wherein

(i) the pH is between 3 and 8;

(ii) the temperature is between 15° C. and 35° C.,

(iii) the fermentation time is between 18 and 216 hours,

(iv) the concentration of the substrate is from 0.5 grams per liter to 20 grams per liter, and

(v) the fermentation product is separated from the culture by extraction.

4,390,557

MICROBIOLOGICAL TRANSFORMATIONS OF IRONE COMPOUNDS

Victor Krasnobajew, Küsnacht, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

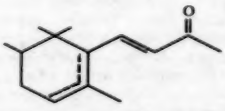
Division of Ser. No. 96,111, Nov. 20, 1979, Pat. No. 4,311,860. This application Aug. 28, 1981, Ser. No. 297,485

Claims priority, application Switzerland, Nov. 24, 1978, 12045/78

Int. Cl.³ A23L *1/226*; C12P *7/226, 7/02*

U.S. Cl. 426—538 16 Claims

1. A process for the manufacture of an odorant and/or flavoring composition which comprises fermenting a compound of the formula



wherein one of the dotted lines represents an additional bond, with a fungus selected from the group consisting of the genera *Botryodioplodia, Botryosphaeria* and *Lasiodiplodia* under aerobic conditions wherein

(i) the pH is between 3 and 8;

(ii) the temperature is between 15° C. and 35° C.,

(iii) the fermentation time is between 18 and 216 hours,

(iv) the concentration of the substrate is from 0.5 grams per liter to 20 grams per liter, and

(v) the fermentation product is separated from the culture by extraction.

4,390,558

STABILIZATION OF PLEUROMUTILIN DERIVATIVES AGAINST OXIDATION BY SODIUM HYPOCHLORITE IN AQUEOUS SOLUTION

Frank Ridgway, Birkenhead, and Richard D. G. Woolfenden, Bridgend, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

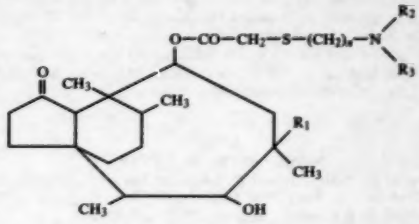
Filed Mar. 6, 1981, Ser. No. 241,167

Claims priority, application United Kingdom, Mar. 14, 1980, 8008792

Int. Cl.³ A61K *31/22*

U.S. Cl. 426—541 3 Claims

1. A composition for water treatment consisting essentially of a hypochlorite scavenger and from 0.0045% to 0.0125% by weight of a compound of the formula



wherein R_1 is either ethyl or vinyl;

n is an integer from 2 to 5 and each of R_2 and R_3 is an alkyl of 1 to 10 carbon atoms, and pharmaceutically acceptable salts of said compound, said hypochlorite scavenger being selected from the group consisting of sodium thiosulphate, acetone, sodium bisulphite, ascorbic acid, dithiothreitol, dithioerythritol, sodium sulphite, sodium nitrate and urea, said compound being present in a weight ratio to said hypochlorite scavenger of from about 0.1:1 to about 500:1.

4,390,559

ISOFLAVONES AND RELATED COMPOUNDS, METHODS OF PREPARING AND USING AND ANTIOXIDANT COMPOSITIONS CONTAINING SAME

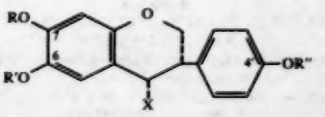
Fritz W. Zilliken, Remagen, Fed. Rep. of Germany, assignor to Z-L Limited Partnership, Janesville, Wis.

Division of Ser. No. 29,122, Apr. 11, 1979, Pat. No. 4,264,509, which is a continuation-in-part of Ser. No. 804,594, Jun. 8, 1977, Pat. No. 4,157,984. This application Jan. 12, 1981, Ser. No. 223,942

Int. Cl.³ A23D *5/04, 3/04*

U.S. Cl. 426—545 14 Claims

14. A method of stabilizing against oxidation an edible fat or oil or food product containing an edible fat or oil which comprises adding to or incorporating in said food product or edible fat or oil a compound having the structure:



wherein the dashed lines represent a single bond or a double fond, and wherein X may be two hydrogen atoms or oxygen, and further wherein each of R, R′ and R″ may be methyl or ethyl group or hydrogen, said compound being present in said edible fat or oil or food product in an amount effective to stabilize said edible fat or oil or food product.

4,390,560

PROCESS FOR PRODUCING A CREAM CHEESE-LIKE FOOD

Kaoru Koide; Yoshiki Yoneda, and Kenkichi Musashi, all of Higashimurayama, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,852
Claims priority, application Japan, Oct. 7, 1980, 55-139393
Int. Cl.³ A23C 19/00, 20/00
U.S. Cl. 426—582 4 Claims

1. A process for producing a cream cheese-like food, comprising mixing casein, an oil or fat, an emulsifying agent, a calcium salt in an amount of 3–24 mg, as calcium, per gram of casein and an orthophosphate to obtain a liquid mixture, heating the resulting liquid mixture, homogenizing the heated liquid mixture, cooling the homogenized liquid mixture to obtain a liquid emulsion, adding gluconic δ-lactone and rennet to the emulsion, maintaining the mixture at 15°–55° C. to regulate the texture and to attain the equilibrium of the emulsion in the pH range of 5.3–5.9, then adding a stabilizer and gluconic δ-lactone to the emulsion, pasteurizing the mixture, and charging the pasteurized mixture into containers.

4,390,561

MARGARINE OIL PRODUCT

Daniel R. Blair; Richard B. Lomneth; Robert L. Prosise, and Bernard Y. Tao, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 4, 1981, Ser. No. 318,162
Int. Cl.³ A23D 5/00
U.S. Cl. 426—607 9 Claims

1. A margarine oil product comprising from about 35% to about 70% of a structural fat consisting essentially of:

(i) from about 3% to about 9% by weight SSS triglycerides;

(ii) from about 32% to about 50% by weight SOS triglycerides;

(iii) from about 5% to about 12% by weight SSO triglycerides; and

(iv) from about 30% to about 65% by weight SOO/SLS triglycerides;

wherein S=saturated C_{16} or C_{18} fatty acid residue, O=oleic acid residue and L=linoleic acid residue; said fat having a weight ratio of P:St acid residues attached to the glycerides of about 8.5 or more and a weight ratio of O:L acid residues of about 3.5 or more, wherein P=palmitic, St=stearic, O=oleic and L=linoleic; and from about 35% to about 70% of a soft oil; said margarine oil product having:

(a) a Solid Fat Content of:

(i) from about 17% to about 54% at 50° F.;

(ii) from about 6% to about 33% at 70° F.;

(iii) from about 4% to about 16% at 80° F.;

(iv) from about 2% to about 7.5% at 92° F.; and

(v) less than 2% at 105° F.;

(b) a Fatty Acid Composition having a weight ratio of P:St acid residues attached to the glycerides of from about 3.4 to 7.5 and a weight ratio of O:L acid residues of about 0.4 to about 2.2, wherein P=palmitic, St=stearic, O=oleic and L=linoleic.

4,390,562

PROCESS OF MANUFACTURING A MAGNETIC RECORD MEMBER

Masahiro Yanagisawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

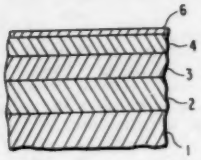
Division of Ser. No. 260,497, May 4, 1981. This application Feb. 9, 1982, Ser. No. 347,389
Claims priority, application Japan, May 6, 1980, 55/57962; May 8, 1980, 55-60898
Int. Cl.³ B05D 5/12
U.S. Cl. 427—11 9 Claims

1. A process of manufacturing a magnetic record member, comprising the steps of:

preparing an alloy disc substrate, the surface of which has a topography of not more than 50 microns in the circumferential direction and not more than 10 microns in the radial direction of the disc substrate;

coating the surface of said disc substrate with a nonmagnetic alloy film and polishing the surface of the nonmagnetic alloy film to a mirror finish;

forming a magnetic metal thin-film medium on the polished surface of the nonmagnetic alloy film;



forming a protective film on the magnetic metal thin-film medium; and

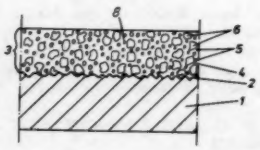
spreading dry, powdered solid lubricant over the surface of said protective film and rubbing the solid lubricant powder against said protective film under pressure to form thereon a uniform thin film of solid lubricant having a thickness smaller than the particle diameter of the solid lubricant powder.

4,390,563

METHOD FOR PRODUCING TOP SURFACING LAYERS

Erich Hodes, Rosbach; Danilo Sternisa, Emmendingen, and Walter Schneider, Wetzlar, all of Fed. Rep. of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Division of Ser. No. 160,127, Jun. 16, 1980, Pat. No. 4,309,474. This application Sep. 25, 1981, Ser. No. 305,701
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928081; Jan. 17, 1980, 3001516
Int. Cl.³ B05D 7/22
U.S. Cl. 427—27 25 Claims



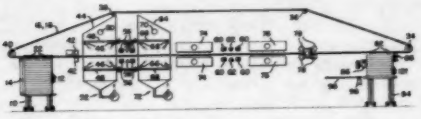
1. The method of producing an anti-friction multilayer bearing laminate comprised of a metallic carrier layer and a working surface layer bonded to said metallic carrier layer and having anti-friction and/or friction characteristics, which includes the steps of: forming a top surfacing synthetic layer by mixing together particles of pulverized polyvinylidene fluoride (PVDF) and lead-containing particles where said lead-containing particles have a size ≤ 40 μm and are provided in a ratio of volume of between 5% and 35% with respect to the total volume of the mixture of polyvinylidene fluoride and lead-containing particles in the top surfacing synthetic layer, applying the mixed polyvinylidene fluoride and lead-containing particles to a prepared surface of a metallic carrier layer in the form of a uniform mixture having a desired thickness to form a working surface layer on the carrier layer, and forming the said applied uniform mixture by the heating of the said metallic carrier layer and applied mixture thereon so as to melt together the particles of pulverized polyvinylidene fluoride into a matrix of said surface layer, said lead-containing particles being imbedded in said matrix and said matrix binding the said surface layer to said metallic carrier layer.

4,390,564

PROCESS AND APPARATUS FOR FINISHING DOORS

Alvin J. Kimble, 5001 Rainier Ave., Tumwater, Wash. 98501

Filed Aug. 20, 1981, Ser. No. 294,774
Int. Cl.³ B05D 1/02, 3/06
U.S. Cl. 427—35 35 Claims



1. A semi-continuous or continuous process for finishing a door in a finishing machine, comprising the steps of:

(a) feeding a plurality of doors to a finishing machine;

(b) conveying each door serially along the machine by holding each door with pressure exerted on the ends of the door while performing the substeps of:

(i) staining the faces and edges of each door in a single staining operation;

(ii) at least partially drying each door;

(iii) finish-coating the faces and edges of each door in a single finish-coating operation; and

(iv) drying the finish coating; and

(c) stacking the finished doors which exit from the machine by removing the pressure exerted on the ends.

11. The process of claim 1 wherein both substeps of drying include blowing warm air around the doors.

12. The process of claim 1 or claim 11 wherein both substeps of drying include radiant heating of the faces of each door.

4,390,565

PHOTOCURABLE COMPOSITIONS FOR USE AS CERAMIC INK VEHICLES

James B. Fonda, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 26, 1982, Ser. No. 411,753
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 10 Claims

1. A radiation-curable ceramic ink composition comprising

(a) from 2 to 30 percent by weight of at least one acrylated polycaprolactone diol polyurethane having a molecular weight in the range from 600 to 3500;

(b) from 2 to 40 percent by weight of a reactive diluent system comprising at least one addition-polymerizable acrylic monomer which is copolymerizable with said acrylated polycaprolactone diol polyurethane;

(c) from 60 to 90 percent by weight of at least one ceramic frit.

10. In the process of applying a ceramic coating to a heat-resistant substrate comprising the steps of:

(a) applying a printing medium to a heat-resistant substrate, said printing medium comprising at least one ceramic frit and a fluid vehicle therefor;

(b) curing said printing medium after it has been applied to said substrate by exposure to a source of irradiation selected from the group consisting of ionizing radiation and actinic radiation; and

(c) firing said coated substrate at a temperature and for a time sufficient to burn-off the vehicle and fuse the ceramic frit to the substrate;

the improvement wherein the printing medium is a radiation-curable ceramic ink composition comprising:

(a) from 2 to 30 percent by weight of at least one acrylated polycaprolactone diol polyurethane having a molecular weight in the range from 600 to 3500;

(b) from 2 to 40 percent by weight of a reactive diluent system comprising at least one addition-polymerizable acrylic monomer which is copolymerizable with said acrylated polycaprolactone diol polyurethane; and

(c) from 60 to 90 percent by weight of at least one ceramic frit.

4,390,566

METHOD OF PRODUCING SOFT SHEET

Masao Umezawa, Shiga, and Miyoshi Okamoto, Takatsuki, both of Japan, assignors to Toray Industries, Inc., Japan

Filed Mar. 9, 1981, Ser. No. 241,634
Int. Cl.³ B05D 5/00
U.S. Cl. 427—198 30 Claims

1. A method of producing a soft sheet material containing thinned fibers or filaments and a viscoelastic substance, which method comprises:

(A) applying a mixture of a viscoelastic substance and a temporary filler to a sheet material containing thinnable fibers or filaments;

(B) thinning the thinnable fibers or filaments of said sheet material;

(C) applying a viscoelastic substance; and

(D) removing said temporary filler.

4,390,567

METHOD OF FORMING GRADED POLYMERIC COATINGS OR FILMS

Raimond Liepins, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,807
Int. Cl.³ B05D 7/24; C23C 11/00
U.S. Cl. 427—214 14 Claims

1. A method of forming a graded metal-bearing polymeric coating on a desired substrate which comprises (a) forming on said substrate a polymeric coating susceptible to permeation by a metal, and (b) contacting said polymeric coating with a fluid containing a metal compound or mixture of metal compounds at a temperature below 150° C. for a time sufficient for such metal compound or metal compounds to sorb and diffuse into said polymeric coating.

4,390,568

LINING A STEEL PIPE INTERNALLY WITH A CEMENT MORTAR

Wilhelm Schwenk; Bruno Heinrich, both of Duisburg, and Rolf Mangen, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmannrufer Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,708
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010525
Int. Cl.³ B05D 7/22, 3/12
U.S. Cl. 427—234 8 Claims

1. The method of lining the interior of a steel pipe for protection against corrosions, comprising:

providing a dispersion, in water, of a synthetic polymer and of a synthetic resin being absorbed on the surface of a blend of cement and sand particles for causing such a blend to remain fluid;

providing a cement mortar which includes said dispersion and having a sand-to-cement ratio of from 1 to 3 and water-to-cement ratio of from 0.25 to 0.35, solids in the dispersion being present from 3 to 30 parts by weight per 100 parts of cement;

applying the cement mortar with dispersion as provided to the interior of the pipe; and

providing high-speed rotation to the pipe to obtain centrifugal action on the mortar as applied and to compact therewith the said mortar to obtain a dense corrosion-proof and corrosion-proofing interior lining for and on the pipe.

4,390,569

PROCESS FOR FORMING A POLYMERIC COATING ON THE OUTSIDE SURFACE OF A LENGTH OF TUBING

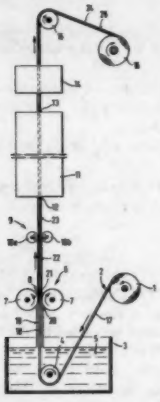
Wolfgang Heinrich, Salach; Klaus-Dieter Hammer, Mainz-Mombach, and Max Bytzek, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,944

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012064

Int. Cl.³ B05D *3/12, 1/40*

U.S. Cl. 427—366 8 Claims



1. A process for coating the outside surface of a length of tubing essentially consisting of cellulose hydrate suitable for use as a sausage casing comprising the steps of:

coating the outside surface of the tubing with an initial layer of coating liquid;

transporting the coated tubing issuing from said coating step along its longitudinal axis in a substantially vertically upward direction;

passing the coated tubing through a constriction of predetermined width to reduce the thickness of the initial layer and form a thin layer of desired thickness on the outside of the tubing;

levelling the thin layer without reducing the weight per unit area of the thin layer to form a layer of uniform thickness; and

exposing the tubing to heat of sufficient temperature to solidify the coating liquid and form an uninterrupted film of uniform thickness on the outside of the tubing, wherein the tubing is in a layflat state during all the process steps and wherein said coating step comprises moistening the tubing with the coating liquid, the tubing having a water-retention capacity in the range of about 120 to 140%, resulting in a water content, before the heating step, in the range of about 20 to 30% of the water retention capacity, wherein the coating liquid comprises an aqueous polymeric dispersion having a content of dispersed polymer of at least about 20% by weight relative to the total weight of the dispersion.

4,390,570

FLUID ROOF SYSTEM

Irene L. Rehberg, Strongsville, Ohio, assignor to Elastic Coating Systems, Inc., Medina, Ohio

Filed Dec. 21, 1981, Ser. No. 332,887

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—385.5 3 Claims

1. A method of providing a roof coating to a structure, comprising the steps of providing an aqueous fluid suspension stable at high ambient temperatures comprising (A) a polymeric emulsion composed of an unreacted mixture of (i) a first self-plasticizing acrylic emulsion polymer having a first Tg low enough that it will not become brittle at subfreezing temperatures, and (ii) a second acrylic emulsion polymer which will dry in air to a harder, higher gloss finish than the first acrylic emulsion polymer and which has a different, second Tg such that the Tg of the resulting coating is low enough that it will not become brittle in subfreezing temperatures, and (B) non-polymeric solids, said polymeric emulsion providing polymeric solids constituting at least about 25% of the total weight of said suspension, said non-polymeric solids comprising no more than about 35% of the total weight of said suspension and said polymeric and non-polymeric solids together forming at least about 50% of the total weight of the fluid suspension, applying the fluid suspension onto a roof substrate in a thickness such that it will dry in the presence of air to a thickness of at least about 20 mils, and allowing the fluid suspension to dry in the presence of air to form an elastic coating on the roof substrate, said elastic coating having at least about a 20 Shore hardness, an elongation of at least about 100%, a tensile strength of at least about 100 psi, and a Tg such that the coating will not become brittle in subfreezing temperatures.

4,390,571

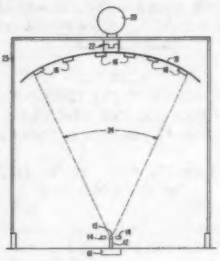
BOATLESS POINT SOURCE EVAPORATION METHOD

James F. Cosgrove, Newburgh; Gerhard P. Dahlke, Fishkill, and Charles Wurms, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,932

Int. Cl.³ B05D *3/02, 3/06, 3/14, 5/12*

U.S. Cl. 427—43.1 7 Claims



1. A method of coating workpieces by vapor deposition comprising the steps of:

placing a workpiece in an evacuated chamber substantially in line with the top of a freestanding metal mass

heating said top of said mass without electron bombardment to form a molten spherical miniscus thereon which serves as a coating source for said workpiece, and

evaporating metal from said molten spherical miniscus portion of said freestanding metal mass whereby said workpiece is coated with said metal.

5. A method as described in claim 1, whereby the top of said mass is radiantly heated.

4,390,572

FUR-LIKE SYNTHETIC MATERIAL AND PROCESS OF MANUFACTURING THE SAME

Miyoshi Okamoto, Takatsuki; Syusuke Yoshida, Otsu, and Nobuo Kurata, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,818

Claims priority, application Japan, Aug. 4, 1980, 55-106407

Int. Cl.³ A01N *1/00;* B32B *3/02, 33/00*

U.S. Cl. 428—15 26 Claims

1. A fur-like synthetic material which comprises a base and

a multiplicity of superfine synthetic pile fibers formed thereon, said fibers having a fineness in the range between about 0.0001–0.4 denier, said pile fibers having lengths in the range of about 4 to 30 mm, said fibers being crimped and further being formed into bundle groups, said bundle groups having thick-

nesses in the range of about 200 to 2 denier as measured at the root portion thereof, said crimps of said pile fibers being substantially in phase with each other within each group, and said superfine pile fibers being substantially free of any binders as between themselves.

4,390,573

LAMINAR THERMOPLASTIC FILM CONSTRUCTIONS

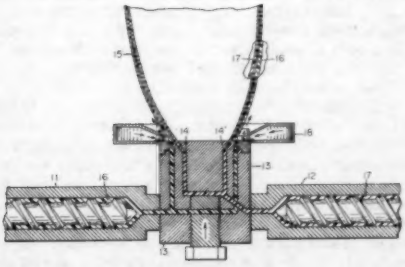
Edward M. Bullard, Rochester, and Gregory M. Smith, Palmyra, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 126,932, Mar. 3, 1980, Pat. No. 4,303,710, which is a continuation of Ser. No. 934,235, Aug. 16, 1978, abandoned. This application Aug. 31, 1981, Ser. No. 298,228

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ B65D *11/00*; B32B *7/02, 27/08*

U.S. Cl. 428—35 **9 Claims**



6. A laminar thermoplastic bag structure comprising at least two layers, an inner layer and an outer layer, said inner layer comprising a general purpose low density polyethylene and said outer layer comprising a resinous blend of a high density polyethylene and ethylene-alpha-olefin copolymer, wherein said blend contains a major amount of said copolymer said layer of low density polyethylene having a thickness in the order of from about 65% up to about 85% of the overall thickness of said laminate.

4,390,574

FELT MATERIAL OF LAYER OF FINE DENIER FELT AND LAYER OF COARSE DENIER FELT

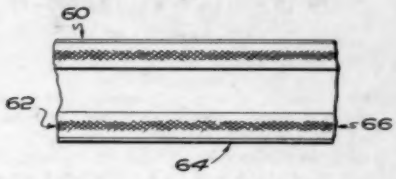
Eric Wood, Wakefield, England, assignor to Insituform International Inc., Channel Islands

Filed Jul. 31, 1981, Ser. No. 288,760

Claims priority, application United Kingdom, Jul. 31, 1980, 8025043; Feb. 19, 1981, 8105184

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—36 **3 Claims**



1. A felt material comprising (a) at least one layer of felt of fine denier, (b) at least one layer of felt of coarse denier, and (c) a filling material having a specific gravity substantially the same as that of said felt.

4,390,575

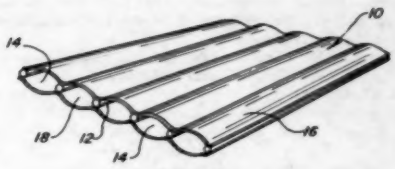
MULTICHANNELED DIFFUSION DEVICE

Clinton V. Kopp, Barrington, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,740

Int. Cl.³ B01D *13/00, 13/02, 13/04, 39/16*

U.S. Cl. 428—36 **24 Claims**



1. The method of disposing a plurality of lengths of fibers into a sheet-like array with the fibers being spaced from each other to define channels therebetween, and bringing a pair of semipermeable membranes into adhering relation with opposed sides of the fibers of said sheet-like array, to form a multichanneled flow device.

16. A multichanneled flow device which comprises a plurality of lengths of fibers in sheet-like array, with the fibers being spaced from each other to define channels therebetween, and a pair of semipermeable membranes positioned in adhering relation with opposed sides of the fibers of said sheet-like array.

4,390,576

ADHESIVE ATTACHMENT ASSEMBLY

Charles G. Hutter, III, Carson City, Nev., assignor to Physical Systems, Inc., Carson City, Nev.

Division of Ser. No. 188,963, Sep. 19, 1980, Pat. No. 4,338,151, which is a continuation-in-part of Ser. No. 74,932, Sep. 13, 1979, Pat. No. 4,302,492. This application Apr. 16, 1982, Ser. No. 369,122

Int. Cl.³ B32B *7/06*

U.S. Cl. 428—40 **12 Claims**

1. An adhesive attachment assembly for applying an attachment to a substrate, comprising:

an attachment;

a support member including a first portion carrying said attachment, and a second portion movably supporting said first portion for movement of said attachment between a first position out of substantial bearing engagement with the substrate and a second position for bearing engagement with the substrate;

connector means for temporarily securing said second portion of said support member with respect to the substrate adjacent said attachment; and

biasing means for applying a force to said attachment to urge said attachment toward the substrate when said second portion is temporarily secured with respect to the substrate and said first portion is in said second position.

4,390,577

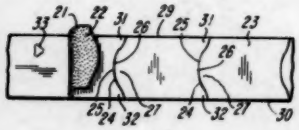
COMPOSITE LABEL WEB

Eneas E. Brister, Fairborn, and Frederick P. Williams, Kettering, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 26, 1981, Ser. No. 238,505

Int. Cl.³ B32B *3/02, 3/16*

U.S. Cl. 428—42 **11 Claims**



1. A composite label web of pressure sensitive labels adapted to be dispensed in a hand-held labeler having a label applying position adjacent a label delaminator, the composite label web comprising: a longitudinally extending carrier web, label material coextensive in width with the carrier web and releasably adhered by pressure sensitive adhesive to the carrier web, wherein the composite label web has been wound into a roll, nonrectilinear, continuous butt cuts across the label material at longitudinally spaced locations defining leading and trailing edges of labels with each label having at least three projecting portions including at least one forwardly projecting portion and at least one rearwardly projecting portion, the leading edge of each label being closer to the outer free end of the carrier web than the respective trailing edge, the leading edge of each label being immediately adjacent to and complementary with the trailing edge of the adjacent label, and the carrier web having means in a predetermined relationship to the butt cuts for registering the labels with respect to a delaminator of a labeler.

4,390,578

METHOD OF JOINING MEMBERS

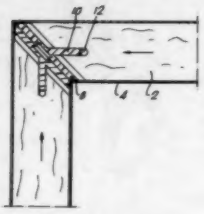
Douglas H. M. Brooks, Crowborough, England, assignor to Blacknell Buildings Limited, Farnborough, England

Filed Mar. 2, 1981, Ser. No. 239,193

Claims priority, application United Kingdom, Mar. 13, 1980, 8008605

Int. Cl.³ B32B *3/00;* **B29C** *19/00*

U.S. Cl. 428—57 **10 Claims**



1. A method of joining the proximate ends of two members, each having a heat sealable sheath projecting from the end of the member to be joined; said method comprising attaching two plates of heat sealable material respectively to the ends of the two members to be joined with the heat sealable sheaths projecting from the members into adjacent relationship with the respective plates, at least partly melting the two plates with heat, allowing the melted plates and the adjacent heat sealable sheaths to fuse together and encase the two members respectively and individually in a continuous mass of heat sealable material at the proximate ends, also pressing together the two melted plates, and retaining the two plates pressed together until the plates have cooled and solidified to effect a joint holding the members together and sealing the members individually within the respective sheaths.

4,390,579

DOPED POLYPHENYLENE ETHER LUBRICANT FOR HIGH DENSITY INFORMATION DISCS

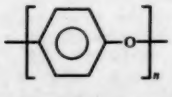
Pabitra Datta, Cranbury, and Eugene S. Poliniak, Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,431

Int. Cl.³ B32B *3/02;* **G11B** *3/70, 5/72*

U.S. Cl. 428—65 **10 Claims**

1. In a high density information disc adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said disc and said stylus, said disc comprising a disc whose surface is conductive and has an information track therein constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said disc coated with a lubricant, the improvement comprising utilizing a lubricant of the formula



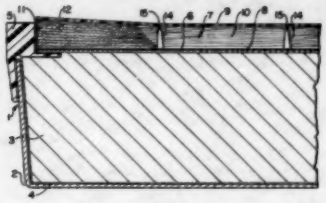
wherein n is an integer, said lubricant containing one or more polar dopants substituted with a long chain alkyl group.

4,390,580

HIGH PRESSURE LAMINATE FOR ACCESS FLOOR PANELS

William J. Donovan, deceased, late of Montclair, N.J.; by A. Gerard Coppola, executor, 17 Brookside Cir., Wilbraham, Mass. 01095, and William D. Sanford, Box 98, R.D. 3, Newton, N.J. 07860

Filed Aug. 26, 1981, Ser. No. 296,498
Int. Cl.³ B32B 3/04
U.S. Cl. 428—68 11 Claims



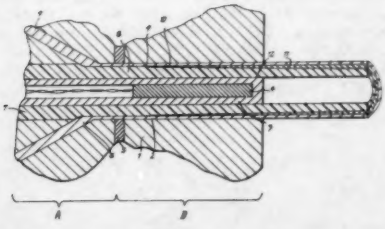
1. An access floor panel comprising a support structure having a high pressure laminate receiving surface; a high pressure laminate having a rigid, impervious melamine plastic layer laminated under high pressure to a resin paper element comprised of multiple sheets of paper impregnated with resin; and an adhesive layer adhesively securing the surface of the resin paper element opposite said melamine plastic layer to said receiving surface to form a bond line between said receiving surface and said resin paper element surface; said resin paper element having at least one groove therein of sufficient depth to cut sufficient grain lines of said resin impregnated paper layer so that, when the resin impregnated paper layer expands or contracts due to moisture absorption or evaporation thereby causing the rigid melamine layer to move outwardly or inwardly with respect to the support structure and creating a stress on said bond line, said at least one groove alleviates said stress on said bond line and thereby inhibits delamination of said high pressure laminate from said support structure.

4,390,581

MOULDING

Frederic N. Cogswell, and David T. Mitchell, both of Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 24,434, Mar. 23, 1979, Pat. No. 4,327,053, which is a continuation-in-part of Ser. No. 831,668, Sep. 8, 1977, abandoned. This application Feb. 26, 1981, Ser. No. 238,662
Claims priority, application United Kingdom, Aug. 23, 1977, 35263/77; Mar. 23, 1978, 11677/78
Int. Cl.³ B29D 7/02; B32B 3/14
U.S. Cl. 428—71 8 Claims



1. A method for producing a shaped article which comprises extruding a thermoplastic polymeric material, initially in a molten state, through a die having a mandrel for constraining the material into a tubular shape and producing thereby a tubular extrudate having an outer surface and an inner surface; coextruding between the die and the outer surface of the polymeric material, a liquid having a freezing temperature lower than that of the polymeric material; cooling the liquid and the outer surface of the polymeric material during their passage through the die, to a temperature below the freezing temperature of the polymeric material but above the freezing temperature of the liquid, while maintaining the inner surface of the polymeric material molten; squeezing the extrudate at suitable intervals to fuse the molten inner surface together and thereby seal discrete lengths; and inflating a sealed length to conform to a surrounding mould, thereby to produce the shaped article, characterised in that the method is applied to a thermoplastic material containing a filler, the ratio of filler to thermoplastic material being at least 15:85 by weight, and that the sealed length of extrudate is moulded into an article with two closely-spaced substantially parallel walls enclosing a volume therebetween, a foamable composition is injected into the enclosed volume and the composition is allowed or caused to foam while the article is held within a constraining means constructed to prevent outward displacement of the spaced-apart walls by pressure from the foaming composition.

4,390,582

CUT PILE FABRIC WITH CARRIER AND TEXTURIZED LOOPS

Robert C. Pickens, Jr., Gurnee; Reese R. Thomas, Libertyville, and John W. Ellicson, McHenry, all of Ill., assignors to Ozite Corporation, Libertyville, Ill.

Continuation of Ser. No. 159,472, Jun. 16, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,540
Int. Cl.³ B32B 5/00
U.S. Cl. 428—85 16 Claims

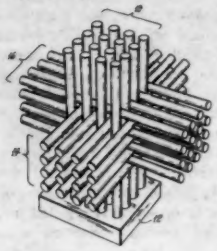
1. A cut pile fabric comprising:
a needled batt of non-woven staple fibers,
a carrier member attached to one surface of said batt,
texturized loops of staple fibers needled from the batt and projecting through said carrier member, said loops defined by fibers extended selectively through the carrier member, said fibers defining the loops are needled from the batt and have fiber ends interlocked with fibers in the needled batt,
the texturized loops of fibers comprising a plurality of clusters of loops of fibers with each cluster containing a plurality of different sized loops of fibers,
backing means formed on another surface of said batt for backing said batt and for securing the fiber ends of the staple fibers of said texturized loops to said batt,
a substantial portion of said different sized loops of fibers being cut to form individual cut pile, and
said cut pile being polished and sheared to provide a plush cut pile fabric.

4,390,583

ALUMINA-ALUMINA COMPOSITE

James P. Brazel, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 22, 1982, Ser. No. 350,776
Int. Cl.³ B32B 5/12
U.S. Cl. 428—113 **10 Claims**



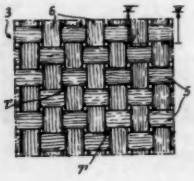
1. An alumina-alumina composite comprising:
a plurality of alumina fibers arranged parallel to at least three axial directions;
each of said fibers comprising a plurality of alumina filaments in a matrix of alumina; and
said plurality of fibers further contained in an alumina matrix.

4,390,584

PROCESS FOR MAKING A PERFORATED RIGID SHEET MATERIAL FOR SOUND ABSORBING COMPOSITE CELLULAR STRUCTURE

Guy Briens, Courbevoie, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 21, 1981, Ser. No. 226,932
Claims priority, application France, Apr. 18, 1980, 80 08728
Int. Cl.³ B32B 3/12
U.S. Cl. 428—116 **8 Claims**



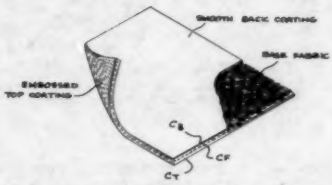
1. A process for making a light, perforated, electrically conducting rigid sheet material suitable for use as the outer surface in a sound absorbing composite cellular structure comprising the steps of:
providing a supple loosely woven fabric comprising a plurality of spaced parallel warp slivers and a plurality of spaced parallel transverse weft slivers interlaced therewith, said warp and weft slivers defining openings corresponding to a porosity greater than that desired in said rigid sheet,
each of said slivers comprising a plurality of substantially straight parallel and unconnected fibers, and a pair of electrically conducting wires arranged respectively at the opposite margins of said sliver, the marginal wires in said slivers being electrically interconnected to form an electrically conducting grid;
impregnating said fabric with a hardenable resin;
applying controlled pressure to opposite faces of said impregnated fabric to create lateral expansion of said slivers sufficient to reduce the porosity to that desired in said sheet; and
hardening said resin while maintaining said pressure, to produce a thin rigid electrically conducting sheet having said desired porosity.

4,390,585

DURABLE FLEXIBLE MEMBRANE AND METHOD OF MAKING SAME

Durrell W. Holden, Dublin, Va., assignor to Bond Cote of Virginia, Inc., Pulaski, Va.

Filed May 5, 1982, Ser. No. 375,339
Int. Cl.³ B32B 3/00
U.S. Cl. 428—172 **20 Claims**



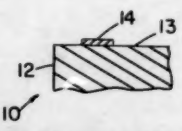
1. A durable flexible membrane comprising:
(1) a generally heavy and dense supporting and reinforcing reticular base fabric formed of thick generally loose bundles each containing a large multiplicity of individual continuous filaments of a synthetic polymer characterized by generally high dimensional stability and resistance to heat and light, said multi-filament bundles being arranged in mechanically interengaged intersecting relation with interstices therein, said base fabric having a weight of substantially about 3–12 oz/yd^2; and
(2) a solidified base coating composition completely impregnating the interstices of said base fabric and continuously coating the opposite sides thereof, which composition consists essentially of polyvinyl chloride resin and as a plasticizing agent for said resin about 35–100% by weight thereof of a trimellitate ester which exhibits high resistance to separation from said resin and imparts to the coating high flexibility at temperatures not higher than about −30° F., said coating composition being present in an amount sufficient to impregnate the interior and form continuous coating on the opposite sides of said base fabric.

4,390,586

ELECTRICAL DEVICE OF SEMI-CONDUCTING MATERIAL WITH NON-CONDUCTING AREAS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 660,800, Feb. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 294,837, Oct. 4, 1972, abandoned, which is a continuation of Ser. No. 849,012, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 442,875, Nov. 24, 1964, Pat. No. 3,461,347, which is a continuation of Ser. No. 86,838, Dec. 27, 1960, Pat. No. 3,169,892. This application Jun. 26, 1978, Ser. No. 919,412
Int. Cl.³ B32B 3/00, 7/00
U.S. Cl. 428—209 **4 Claims**



1. An electrical device comprising a device supporting sub-

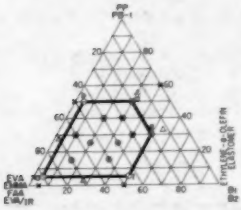
state, a semi-conducting material on said substrate, said semi-conducting material having a portion thereof converted to its non-conducting oxide to a selected depth with non-converted semi-conducting material adjacent at least two opposed sides of said non-conducting oxide, said non-conducting oxide comprising means for restraining the flow of electrons between the separated non-converted portions of said semi-conducting material.

4,390,587

LOW-TEMPERATURE, SHRINKAGE GAS-BARRIER MULTILAYERED FILM

Isao Yoshimura, Fujisawa, and Takao Togashi, Suzuka, both of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,191
Claims priority, application Japan, Jun. 16, 1980, 55-80252
Int. Cl.³ B65D *25/06*; B32B *27/08*
U.S. Cl. 428—215 **32 Claims**



1. A low-temperature shrinkage, gas-barrier film comprising a multilayered film having at least a three-layered construction represented by the combination of Resins D/E/D wherein:

Resin D is a mixture of 50 to 90% by weight of a Resin A which is a copolymer of ethylene and a vinyl ester or an alkyl ester of an unsaturated aliphatic carboxylic acid, 5 to 30% by weight of a Resin B which is an ethylene-α-olefin copolymer having a density of not more than 0.91 g/cm³ and a Vicat softening point of not more than 70° C., and 5 to 30% by weight of a Resin C which is a crystalline polypropylene or crystalline polybutene-1 or a mixture of the two polymers, and

resin E is a vinylidene fluoride copolymer exhibiting a crystal melting peak at a temperature within the range of from 140° to 155° C. as measured by the DSC method and a solution viscosity of from 1.05 to 0.85 c.p., the total thickness of the multilayered film being 30 to 100μ and the resin E layer having a thickness within the range of from 5 to 25μ and accounting for a proportion within the range of from 5 to 35% of the total thickness.

4,390,588

PROCESS FOR COATING CLOTH OF METALLIZED TEXTILE FIBERS AND THEIR USE FOR THE PRODUCTION OF MICROWAVE-REFLECTING ARTICLES

Harold Ebneth, and Siegfried Klipfel, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,023
Claims priority, application Fed. Rep. of Germany, May 6, 1980, 3017204
Int. Cl.³ B32B *15/14, 15/20*; B05D *3/02*
U.S. Cl. 428—263 **10 Claims**

1. A process for increasing the abrasion resistance and water resistance of cloth textiles metallized by direct deposition, comprising (A) coating said cloth with a reactive polyurethane system which may be dissolved in an organic solvent, containing from 0.5 to 15% by weight, based on solids, of free isocyanate groups and optionally, (B) applying an additional coating characterized by its permeability to radar waves before said (A) coating is hardened, (C) hardening the coating in a known manner, optionally by heating and of simultaneous removal of any solvents used.

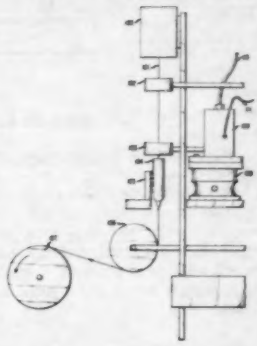
10. Coated, metallized cloth textiles produced in accordance with the process of claim 1.

4,390,589

METAL COATING OF FIBERS

Franz T. Geyling, Morristown, and Theodore J. Louzon, Bridgewater, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 26, 1982, Ser. No. 352,511
Int. Cl.³ G02B *5/14, 1/10*; B05D *7/70, 1/18*
U.S. Cl. 428—381 **15 Claims**



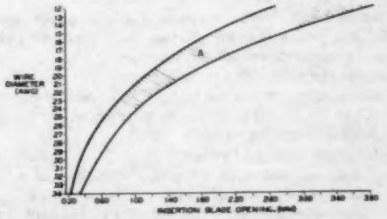
1. A method of making a metal-coated fiber characterized by radially confining around a fiber or an intermediate layer thereon a slurry comprising a multiphase alloy that is in the form of a solid phase and a liquid phase while passing said fiber axially through a slurry confinement means, and cooling said slurry to the solid state.

4,390,590

POWER INSERTABLE POLYAMIDE-IMIDE COATED MAGNET WIRE

Hollis S. Saunders; Richard V. Carmer, and Lionel J. Payette, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Ft. Wayne, Ind.

Filed Oct. 19, 1981, Ser. No. 312,582
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—383 **10 Claims**



1. A lubricated magnet wire comprising an electrically conducting substrate having an electrically insulating polyamide-imide outer coating, and an external lubricant coating on the polyamide-imide outer coating comprising a mixture of paraffin wax and hydrogenated triglyceride in a ratio by weight of

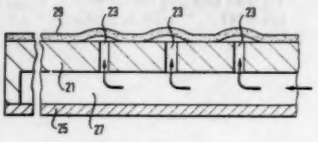
1:30 to 30:1, the coated magnet wire capable of power insertion into coil slots in its locking wire size range.

4,390,591

STABILIZED FINISH COMPOSITION

Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

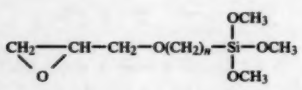
Filed Oct. 30, 1981, Ser. No. 316,583
Int. Cl.³ B32B *25/04*
U.S. Cl. 428—391 **46 Claims**



1. An oil-in-water yarn finish composition, the nonaqueous portion of which comprises:

(a) about 0.25 to 10 weight percent of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid;

(b) an adhesion promoting amount of a silane having the structural formula



wherein n=2 to 5; and

(c) the balance comprising:

about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups;

about 15 to 28 weight percent of polyoxyalkylene castor oil;

about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof;

about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and mixtures thereof; and

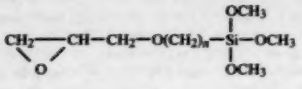
about 1 to 5 weight percent of a suitable antioxidant.

32. In a process for the production of synthetic polymer yarn, the improvement which comprises:

treating the yarn with a sufficient amount of an oil-in-water yarn finish composition to achieve a total oil-on-yarn of 0.1 to 2.0 weight percent, the nonaqueous portion of the composition comprising:

(a) about 0.25 to 10 weight percent of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid;

(b) an adhesion promoting amount of a silane having the structural formula



wherein n=2 to 5; and

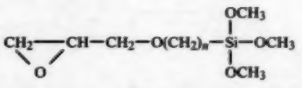
(c) the balance comprising: about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups; about 15 to 28 weight percent of polyoxyalkylene castor oil; about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof;

about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and

mixtures thereof; and about 1 to 5 weight percent of a suitable antioxidant.

39. A method for improving the emulsion stability of an oil-in-water yarn finish composition by adding thereto the nonaqueous portion which comprises:

(a) an adhesion promoting amount of a silane having the structural formula



where n=2 to 5; and

(b) the balance comprising:

about 55 to 60 weight percent of a lubricant comprising transesterified lauric oil and oleic oil, the lauric oil containing at least about 40 percent lauric groups and the oleic oil containing at least about 60 percent oleic groups, said lubricant including about 10 to 90 percent lauric oil and

about 10 to 90 percent oleic oil;

about 15 to 28 weight percent of polyoxyalkylene castor oil;

about 4 to 15 weight percent selected from the group consisting of triglycerol monooleate, triglycerol dioleate and mixtures thereof;

about 7 to 12 weight percent selected from the group consisting of decaglycerol tetraoleate, decaglycerol pentaoleate and mixtures thereof; and

about 1 to 5 weight percent of a suitable antioxidant; said method comprising:

adding about 0.25 to 10 percent, based on the weight of the final nonaqueous portion of the composition, of an emulsion stabilizer selected from the group consisting of a salt of dialkyl sulfosuccinate neat wherein each alkyl group comprises 8 to 18 carbon atoms, a salt of dialkyl sulfosuccinate in solution or mixture wherein each alkyl group comprises 9 to 18 carbon atoms, and a mixture of a salt of dioctyl sulfosuccinate and a salt of an aromatic carboxylic acid.

4,390,592

LOW TEMPERATURE REDUCTION PROCESS FOR PHOTOMASKS

Fred M. Ernsberger, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 20, 1981, Ser. No. 323,333
Int. Cl.³ B32B *15/04*; C03C *21/00*
U.S. Cl. 428—410 **10 Claims**

1. In a method for producing a stain pattern in a glass substrate comprising the steps of injecting stain-producing cations

into a surface of a glass substrate and heating the glass in the presence of a reducing agent to reduce and agglomerate the stain-producing cations to produce a stain pattern within the surface of the glass, the improvement which comprises utilizing hydrogen under superatmospheric pressure as the reducing agent at a temperature less than about 300° C.

8. An article of manufacture comprising a transparent glass substrate and within said glass substrate a pattern of stain-producing metal wherein the roll-off region of the pattern edges is not more than one micron wide.

4,390,593

LAMINATED GOB FOR PRESSING GLASS ARTICLES

John H. Olson, Newport News, Va., and Robert J. Schlaufman, Elmira, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 259,395, May 1, 1981. This application Feb. 5, 1982, Ser. No. 346,027
Int. Cl.³ B32B 17/06; C03B 7/14
U.S. Cl. 428—410 2 Claims

1. A laminated charge of molten glass for use in forming a laminated article having a core of one glass which is completely surrounded by a substantially uniform thickness of a skin of a second glass comprising, a charge of molten glass having upper and lower surface portions and an outer circumferential peripheral portion intermediate said upper and lower surface portions, said charge having an inner central core glass portion encompassed within an outer skin glass portion, and said skin glass portion having a reentrant portion projecting radially within said core glass portion from said outer circumferential peripheral portion intermediate the upper and lower extent of said charge of molten glass.

4,390,594

PLASTICIZERS FOR POLYVINYL BUTYRAL

Daniel Duges, Les Mureaux, France, assignor to Saint Gobain Vitrage, Neuilly-sur-Seine, France

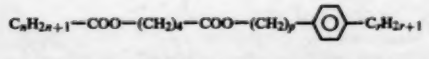
Filed Dec. 1, 1981, Ser. No. 326,230
Claims priority, application France, Dec. 2, 1980, 80 25535
Int. Cl.³ C08F 45/38; B32B 17/10, 27/42
U.S. Cl. 428—437 20 Claims

10. A laminated safety glass comprising two sheets of glass having between the glass surfaces an interlayer of polyvinyl butyral having a molecular weight between about 30,000 and 600,000, a 0 to 10% content by weight of residual ester groups, calculated as polyvinyl acetate and a 12 to 25% content by weight of hydroxyl groups, calculated as polyvinyl alcohol, plasticized with a plasticizer mixture of:

(a) between about 10 and 90% of at least one triethylene glycol diester of a monocarboxylic acid wherein the carbon chain comprises 7 or 8 carbon atoms; and

(b) between about 90 and 10% of at least one adipate which is:

(i) an alkyl alkylaryl adipate having the general formula;



wherein n is greater than or equal to 1 and the sum of p+r is greater than or equal to 1; or

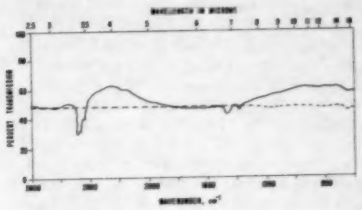
(ii) a dialkyl adipate in which the alkyl group contains from 3 to 8 carbon atoms.

4,390,595

ENVIRONMENTALLY PROTECTED IR WINDOWS

Frederick G. Yamagishi, Newbury Park, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 25, 1979, Ser. No. 88,269
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ B05D 3/06; G02B 1/10
U.S. Cl. 428—446 23 Claims



1. An environmentally protected optical element for use in infrared detection systems comprising a transparent substrate having polished optical surfaces coated with a plasma polymerized saturated short chain hydrocarbon film which increases transmission in the 8 to 12 μm region while providing protection against corrosion and abrasion of said optical surfaces.

13. A method of providing a protective barrier for the surfaces of optical elements utilized in infrared detection systems comprising:

(a) placing said element in an RF discharge reactor adapted for controllably receiving a gaseous reactant;

(b) operating said reactor at 50–200 watts as gaseous alkane monomers are passed through said reactor thereby causing said monomers to polymerize whereby thin films are formed which deposit onto the surfaces of said elements to provide a transparent protective coating which prevents corrosion and abrasion; and

(c) subsequently passing a gaseous alkene through said reactor whereby free radicals, formed from the reaction of said monomers with said plasma, are quenched prior to exposure of said film coated elements to ambient environments.

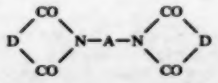
4,390,596

ENCAPSULATION OF ELECTRONIC COMPONENTS IN BIS-IMIDO POLYMER

Serge Laurent, Bron, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 3, 1980, Ser. No. 203,379
Claims priority, application France, Nov. 9, 1979, 79 28145
Int. Cl.³ B32B 27/06; B29C 13/02
U.S. Cl. 428—473.5 17 Claims

1. An article of manufacture which comprises an electronic component encapsulated within a bisimido polymer molding composition, said polymer comprising (i) the thermosetting prepolymer consisting essentially of the reaction product obtained upon reacting a bis-imide having the structural formula:



(I)

in which D represents a divalent organic radical containing an olefinic carbon-carbon double bond and A is a divalent organic radical containing from 2 to 30 carbon atoms, and a polyamine having the structural formula:

$R(NH_2)_x$ (II)

in which x is an integer equal to at least 2 and R represents an organic radical of valency x, the amount of bis-imide being from 0.55 to 25 mols per mol of NH_2 groups provided by the polyamine and wherein said thermosetting prepolymer has a softening point between 50° C. and 120° C., and the change in the modulus of complex rigidity thereof as a function of time, upon curing at 170° C., is such that, after 5 minutes, said modulus ranges from 3×10^4 to 10^7 N/m and that, after 15 minutes, same has increased to a value ranging from 3×10^5 to 3×10^7 N/m; and said molding composition further comprising (ii) a freeradical polymerization initiator, and (iii) filler.

11. The article of manufacture as defined by claim **1**, the bis-imido polymer having been thermoset.

17. A method for the fabrication of the article of manufacture as defined by claim **11**, comprising introducing the electronic component to be encapsulated within a mold cavity, next completely filling said mold cavity by transfer or injection molding an homogenized admixture of said molding composition about said electronic component, and thence post-curing said thermosetting molding composition.

4,390,597

INTERPOLYMER LATEX AND PROCESS FOR THE PREPARATION THEREOF

Bernard Chauvel, Ermont, France, assignor to Rhone-Poulenc Industries, Courbevoie, France

Filed Nov. 12, 1981, Ser. No. 320,302
Claims priority, application France, Nov. 19, 1980, 80 24516
Int. Cl.³ B32B *23/08*
U.S. Cl. 428—512 **13 Claims**

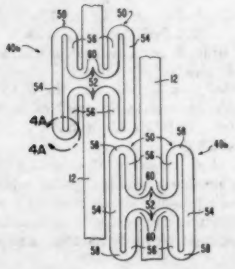
1. A latex of an interpolymer composed of a copolymer A comprising copolymerized butadiene, styrene and at least one ethylenically unsaturated carboxylic acid and a bis(2-chloroethyl)vinylphosphonate polymer B which is at least partly grafted onto copolymer A.

4,390,598

LEAD FORMAT FOR TAPE AUTOMATED BONDING

William S. Phy, Los Altos Hills, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 5, 1982, Ser. No. 365,686
Int. Cl.³ H01L *23/48*
U.S. Cl. 428—577 **16 Claims**



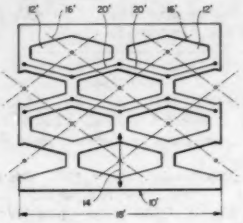
1. In an electrically conductive lead, a stretch loop including two forks which define a pair of branches, wherein each of said branches comprises a plurality of axially aligned segments connected by lateral segments which are shorter than said axially aligned segments, the sum of the lengths of said segments in each branch being greater than the distance between the forks so that the leads may be extended by applying a tensile force.

4,390,599

ENHANCED RECOVERY MEMORY METAL DEVICE

Harry C. Broyles, Sunnyvale, Calif., assignor to Raychem Corporation, Calif.

Filed Jul. 31, 1980, Ser. No. 173,948
Int. Cl.³ C22F *1/00*
U.S. Cl. 428—597 **15 Claims**



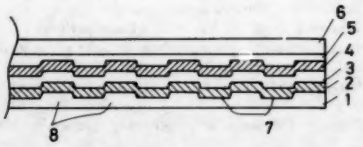
1. A device comprising a sheet of memory metal, said metal possessing a thermoelastic transition between a martensitic state and an austenitic state, said sheet being deformed dimensionally while in its martensitic state and capable of recovering to its non-deformed dimension in its austenitic state in substantially a single direction within the plane of said sheet, said sheet having a plurality of perforations, said perforations being in a particular shape and being arranged in a particular pattern, said shape and pattern enhancing the recovery of said sheet to deliver motion and force in said direction beyond the inherent recovery of the memory metal comprising said sheet if said perforations were not present.

4,390,600

MAGNETO-OPTIC MEMORY MEDIUM

Kenji Ohta, Yao, and Akira Takahashi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,132
Claims priority, application Japan, Jan. 14, 1981, 56-4090; Apr. 9, 1981, 56-54070; Apr. 10, 1981, 56-54711
Int. Cl.³ B21D *39/00*
U.S. Cl. 428—621 **7 Claims**

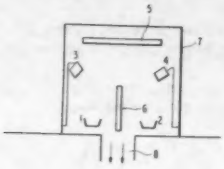


1. A magneto-optic memory medium comprising:
a substrate having strip-like grooves,
a magneto-optic magnetization film disposed on said substrate and having an axis of easy magnetization perpendicular to its surface; and
a reflective film overlying said magneto-optic magnetization film.

4,390,601
MAGNETIC RECORDING MEDIUM AND PROCESS FOR THE PRODUCTION THEREOF

Yoshihiro Ono; Akira Nabara, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 2, 1980, Ser. No. 165,439
Claims priority, application Japan, Jul. 2, 1979, 54-82706; Jul. 2, 1979, 54-82707; Jul. 2, 1979, 54-82709; Jul. 2, 1979, 54-82710
Int. Cl.³ H01F *10/00*
U.S. Cl. 428—412 **15 Claims**

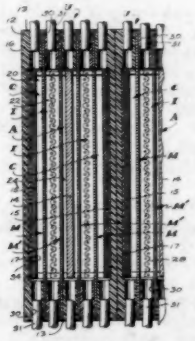


1. A magnetic recording medium comprising a non-magnetic support having thereon a vapor deposited solid film of a ferromagnetic material formed by vacuum evaporation, and on the surface of said ferromagnetic material there being further provided a vapor deposited film of an organic lubricant selected from the group consisting of a paraffin wax, a higher fatty acid, an oxyfatty acid, a fatty acid amide, a fatty acid ester, a fatty alcohol, a metal soap and a mixture thereof or a mixture of the organic lubricant and a macromolecular material.

4,390,602
FUEL CELL

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Filed Sep. 21, 1981, Ser. No. 303,728
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—26 **17 Claims**

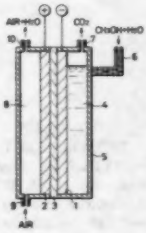


1. A fuel cell comprising an anode section including an anode terminal, an anode fuel supply and an anolyte containing negative and positive charged anolyte ions, a cathode section including a cathode terminal, an electron distributing means and a catholyte containing negative and positive charged catholyte ions, an ion exchange section between the anode and cathode sections and including an ionolyte containing negative and positive charged ionolyte ions, a first ion transfer membrane between and separating the anolyte and ionolyte and a second ion transfer membrane between and separating the ionolyte and the catholyte, an electric circuit connected with and between the anode and cathode terminals conducting electrons from the anode section and delivering electrons to the cathode section, the anolyte is such that when certain anolyte ions of one charge are removed from it, remaining anolyte ions of the other charge react with the anode fuel to generate free electrons, the catholyte is such that when electrons are added to it, certain ionolyte ions of one charge move to combine with it, the ionolyte is such that said certain anolyte ions of one charge removed from the anolyte move to and combine with it and is such that when those anolyte ions are combined with it, those certain ionolyte ions of one charge are released by it, the first membrane allows movement of said certain anolyte ions of one charge through it, the second membrane allows movement of said certain ionolyte ions of one charge through it.

4,390,603
METHANOL FUEL CELL

Hidejiro Kawana; Tatsuo Horiba; Kazuo Iwamoto, all of Hitachi; Kazunori Fujita, Tohkai, and Kohki Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,773
Claims priority, application Japan, Jun. 30, 1981, 56-102596; Aug. 21, 1981, 56-130292
Int. Cl.³ H01M *8/10, 8/22*
U.S. Cl. 429—30 **6 Claims**



1. A methanol fuel cell comprising:
a positive electrode which has two major surfaces, the first major surface lying in direct contact with an oxygen-containing gas;
a hydrogen ion- and/or hydronium ion-conductive solid film which has two major surfaces, the first major surface lying in close contact with the second major surface of said positive electrode, and which has a methanol permeability coefficient of at most 1×10^{-6} mol/(mol/l).min.cm^2;
a negative electrode which has two major surfaces, the first major surface lying in close contact with the second major surface of said solid film; and
methanol fuel which lies in direct contact with the second major surface of said negative electrode.

4,390,604
COMPLEX METAL SULFIDE CATHODES FOR NONAQUEOUS CELLS

William P. Evans, Rocky River, and Violeta Z. Leger, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1981, Ser. No. 278,896
Int. Cl.³ H01M *6/14, 4/58, 4/52, 4/56*
U.S. Cl. 429—197 **12 Claims**

1. A solid cathode material for nonaqueous cell systems which comprises a metal sulfide selected from the group consisting of $PbFeS_2$ and a material having the formula

$$M_aFe_bS_c$$

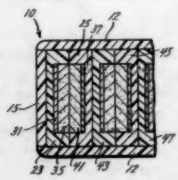
where

M is one or more mono- or divalent metals selected from the group consisting of Co, Ni, Sn, Mn, Zn, Cd, Hg and Ag;

Fe is divalent iron;
S is sulfur (as sulfide);

a and b are each greater than 0 with the proviso that a+b=2 when M is divalent and a+b=3 when M is monovalent; and
c=2.

4,390,605
SOURCE OF ELECTRICITY
Frank D. Marhanka, 30 Ruth Dr., Florissant, Mo. 63031
Continuation-in-part of Ser. No. 852,708, Nov. 18, 1977, abandoned, and a continuation-in-part of Ser. No. 852,925, Nov. 18, 1977, abandoned. This application Mar. 1, 1979, Ser. No. 16,360
Int. Cl.³ H01M 6/00
U.S. Cl. 429—218 **11 Claims**

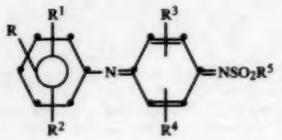


1. A source of electricity which comprises a first electrode, a second electrode that is spaced from said first electrode, said electrodes being made of metals that are spaced apart in the electromotive series, a first mass which contains particulates and liquid and which is electrically conductive, said mass abutting, and being in electrically-conducting engagement with, the inner surface of said first electrode, a second mass which contains particulates and liquid and which is electrically conductive, at least one of the particulates in said second mass being different from all of the particulates in said first mass, said second mass abutting, and being in electrically-conducting engagement with, the inner surface of said second electrode, said first mass and said second mass having confronting surfaces that abut, and are in intimate electrical engagement with, each other, one of said masses having a polarity-imparting material therein, and said polarity-imparting material and said liquids enabling said masses to cause said electrodes to supply a unidirectional flow of current through any load which is connected across them.

4,390,606
COLOR-FORMING PARA-SULFONAMIDODIPHENYLAMINE DYE PRECURSOR AND SULFONIMIDE DYE IN PHOTOGRAPHIC MATERIAL AND PROCESS
Rolf S. Gabrielsen, Webster; Patricia A. Graham, Williamson; James E. Kiljanowicz, Pittsford, and Max H. Stern, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 280,626, Jul. 6, 1981, abandoned. This application Jul. 1, 1982, Ser. No. 394,349
Int. Cl.³ G03C 7/00, 1/40
U.S. Cl. 430—9 **55 Claims**

45. In an exposed and processed photographic element comprising a support having thereon a dye image, the improvement comprising:

as said dye image, a dye consisting essentially of a sulfonimide dye represented by the formula:



wherein:

R is in the meta or para position and is an electron donating substituent selected from

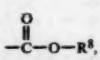
alkoxy containing 1 to 20 carbon atoms, aryloxy containing 6 to 20 carbon atoms, sulfonamido and carboxamido groups;

R^1 is in the ortho or meta position and is hydrogen, alkyl containing 1 to 3 carbon atoms, carbamoyl, alkoxy containing 1 to 3 carbon atoms, sulfonylalkyl containing 1 to 3 carbon atoms, sulfonylaryl containing 6 to 12 carbon atoms, chlorine, bromine, iodine or fluorine;

R^2 is hydrogen, alkyl containing 1 to 3 carbon atoms, carbamoyl, alkoxy containing 1 to 3 carbon atoms, sulfonylalkyl containing 1 to 5 carbon atoms, sulfonylaryl containing 6 to 12 carbon atoms, chlorine, bromine, iodine or fluorine;

R^3 is hydrogen, alkyl containing 1 to 20 carbon atoms, haloalkyl containing 1 to 3 carbon atoms, alkoxy containing 1 to 20 carbon atoms, an ester containing 1 to 20 carbon atoms, carboxy, carboxamido, chlorine, bromine, iodine, fluorine, carbamoyl, sulfonic acid, sulfamyl, sulfonylalkyl containing 1 to 5 carbon atoms, ureido or a carbocyclic group containing 5 to 12 carbon atoms;

R^4 is hydrogen, alkyl containing 1 to 3 carbon atoms, alkoxy containing 1 to 20 carbon atoms, an ester represented by the formula



carboxy, carboxamido, chlorine, bromine, iodine, fluorine, carbamoyl, sulfonic acid, sulfamyl, sulfonylalkyl containing 1 to 3 carbon atoms, uredio and a carbocyclic group containing 3 to 6 carbon atoms;

R^5 is alkyl containing 1 to 20 carbon atoms or aryl containing 6 to 20 carbon atoms;

R^6 is hydrogen, alkyl containing 1 to 20 carbon atoms,

or aryl containing 6 to 20 carbon atoms, or represents, with R^7, atoms completing a 5- or 6-member heterocyclic group;

R^7 is alkyl containing 1 to 20 carbon atoms, carbamoyl, carboxamido, or represents, with R^6, atoms completing a 5- or 6-member heterocyclic group;

R^8 is alkyl containing 1 to 4 carbon atoms; and

$R^{6,4}$ is alkyl containing 1 to 20 carbon atoms.

4,390,607

CHARGE TRANSFER IMAGING PROCESS

Hsin-hsin Chou, Woodbury, and William A. Hendrickson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1982, Ser. No. 345,401

Int. Cl.³ G03G *13/18*

U.S. Cl. 430—48 11 Claims

1. A process for providing an image by transferring an imagewise distributed charge from one surface to another and subsequently forming a visible image on the another surface to which said charge is transferred characterized by the fact that said transferring is effected by close proximity between two surfaces at least one of which surfaces has conductivity sites comprising discrete sites of an inorganic material, said discrete sites having an average length of between 1.0 and 20.0 nm and covering between 0.1 and 40% of said surface.

4,390,608

LAYERED CHARGE GENERATOR/TRANSPORT ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR USES BISAZO PIGMENT

Mitsuru Hashimoto, Numazu; Masaomi Sasaki, Susono; Toshio Fukagai, Numazu, all of Japan; Tatsuya Katoh, deceased, late of Yokodera, Japan (by Tazuki Katoh, heir), and by Mankichi Katoh, heir, Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,083

Claims priority, application Japan, Dec. 9, 1980, 55-173692; Dec. 9, 1980, 55-173693; Dec. 9, 1980, 55-173694; Dec. 9, 1980, 55-173695; Dec. 9, 1980, 55-173696; Dec. 9, 1980, 55-173697; Dec. 9, 1980, 55-173698; Dec. 19, 1980, 55-178754; Dec. 19, 1980, 55-178764; Dec. 19, 1980, 55-178773; Dec. 19, 1980, 5 5-178774; Dec. 19, 1980, 55-178775; Dec. 19, 1980, 55-178776; Dec. 19, 1980, 55-178777; Dec. 19, 1980, 55-178778; Dec. 19, 1980, 55-178779

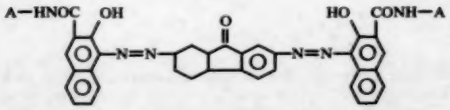
Int. Cl.³ G03G *5/06*

U.S. Cl. 430—57 11 Claims

1. In a layered electrophotographic photoconductor comprising an electroconductive support material and a photoconductive double layer which consists of a charge generation layer and a charge transport layer, the improvement wherein:

a. said charge generation layer comprises a charge generating material selected from the group consisting of bisazo pigments represented by formula (1)

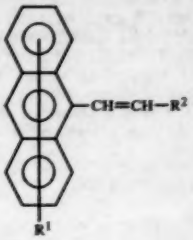
(1)



wherein A represents—C_6H_4—Cl(o), —C_6H_4—Cl(m), —C_6H_4—Br(o), —C_6H_4—Br(m), —C_6H_4—F(o), —C_6H_4—F(m), —C_6H_4—F(p), or —C_6H_4—I(m); and

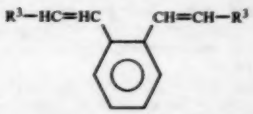
b. said charge transport layer comprises a charge transporting material selected from the group consisting of the anthracene compounds represented by formula (2) and distyrylbenzene compounds represented by formula (3)

(2)



wherein R^1 represents hydrogen or halogen; and R^2 represents a substituted or unsubstituted phenyl group, a naphthyl group, an anthryl group or a carbazole group,

(3)



wherein R^3 represents a carbazoyl group, a pyridyl group, a thienyl group, an indolyl group, a furyl group, a phenyl group, a styryl group, a naphthyl group, an anthryl group, which phenyl group, styryl group, naphthyl group and anthryl group are unsubstituted or substituted with one member selected from the group consisting of a dialkylamino group, an alkyl group, an alkoxy group, a carboxyl group or an esterified carboxyl group, halogen, a cyano group, an aralkylamino group, an amino group, a hydroxy group, a nitro group and an acetylamino group.

4,390,609

ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH ABRASION RESISTANT OVERCOAT

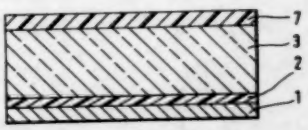
Wolfgang Wiedemann, Geisenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,050

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032774

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—58 7 Claims



1. An electrophotographic recording material comprising an electrically conductive support, a photoconductive layer containing at least one organic charge carrier generating compound and at least one organic charge transporting compound, and a protective transparent covering layer having a thickness in the range from about 0.5 to about 10 μm and comprising a surface abrasion resistant subsequently crosslinkable material, said abrasion resistant material being a two-component system comprising a polyisocyanate selected from the group consisting of aliphatic polyisocyanates and aromatic polyisocyanates and a cross-linking, hydroxyl group containing compound

selected from the group consisting of saturated polyesters, saturated polyethers, acrylic resins and epoxy resins.

4,390,610

LAYERED ELECTROPHOTOGRAPHIC IMAGING ELEMENT, APPARATUS AND METHOD SENSITIVE TO GALLIUM ARSENIDE LASER, THE ELEMENT INCLUDING TWO CHARGE GENERATION LAYERS AND A POLYCARBONATE ADHESIVE LAYER

Larry D. Bowden, Boulder County; Albert H. Miyashita, Boulder, and Charles I. Ravenelle, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,368
Int. Cl.³ G03G 5/06
U.S. Cl. 430—58 8 Claims

1. A layered electrophotographic imaging element, having a spectral sensitivity compatible with the spectral output of a gallium arsenide layer, which spectral output is maximum at about 8200 angstroms, said element comprising:

an electrically conductive layer;

a layer of polycarbonate polymer on said conductive layer and acting as an adhesive layer for

a first charge generating layer containing an active charge generating constituent selected from the group chlorodiane blue and tetramethylbenzidine, located on said polycarbonate layer;

a second charge generating layer on said first charge generating layer and containing hydroxy squarylium as its active charge generating constituent; and

a charge transport layer on said second charge generating layer.

4,390,611

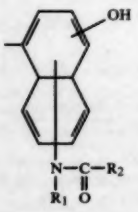
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE AZO PIGMENT CONTAINING MEMBERS

Shozo Ishikawa; Kazuharu Katagiri; Katsunori Watanabe, and Makoto Kitahara, all c/o Copyer Kabushiki Kaisha, 3-3, Shimorenjaku 6-chome, Mitaka-shi, Tokyo, Japan

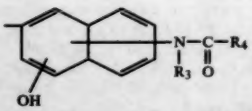
Filed Sep. 22, 1981, Ser. No. 304,564
Claims priority, application Japan, Sep. 26, 1980, 55-132965; Oct. 4, 1980, 55-138263; Oct. 4, 1980, 55-138264; Oct. 4, 1980, 55-138265; Oct. 4, 1980, 55-138266; Nov. 4, 1980, 55-153814; Nov. 28, 1980, 55-166557; Jul. 3, 1981, 56-104856; Jul. 3, 1981, 56-104857; Jul. 3, 1981, 56-104858
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—59 72 Claims

1. An electrophotographic photosensitive member comprising a conductive support, a charge transport layer, and a charge generating layer comprising azo pigments having at least one azo group linked to a coupler residue represented by the following formula or:

Formula [1]



Formula [2]



4,390,612

COLLOID RELIEF IMAGES FORMED BY OXIDIZED DEVELOPER TRANSFER

Robert L. Rutledge, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 904,546, May 10, 1978, Pat. No. 4,363,864. This application Aug. 13, 1982, Ser. No. 407,720
Int. Cl.³ G03C 5/54
U.S. Cl. 430—202 8 Claims

1. A process for forming a colloid relief image on a substrate, comprising the steps of:

a. exposing to actinic light a sheet structure comprising a substrate having coated on one surface thereof a first layer comprising a colloid material capable of being tanned when contacted by oxidized silver halide developer, and coated over said first layer a second layer comprising a photographic silver halide emulsion, said emulsion containing substituted gelatin, said substituted gelatin being substantially resistant to tanning by said oxidized silver halide developers;

b. developing said exposed sheet structure with oxidizable silver halide developers;

c. washing said sheet structure with warm water, whereby all of said second layer is removed from said sheet structure together with portions of said first layer which have not been tanned by contact with oxidized silver halide developers.

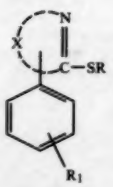
4,390,613

DIFFUSION TRANSFER PHOTOGRAPHIC SYSTEM UTILIZING SUBSTITUTED PHENYLMERCAPTOAZOLES

Avinash C. Mehta, Belmont; George H. Nawn, Westwood, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,502
Int. Cl.³ G03D 1/48
U.S. Cl. 430—219 40 Claims

1. A photographic product for use in forming a diffusion transfer photographic image comprising a photosensitive element comprising a support carrying at least one silver halide emulsion layer having associated therewith an image dye-providing material, a second sheet-like element positioned in superposed or superposable relationship with said photosensitive element, an image receiving layer positioned in one of said elements, means for lowering the pH of an aqueous alkaline processing composition positioned in one of said elements, a rupturable container releasably holding an aqueous alkaline processing composition adapted, when distributed between a pair of predetermined layers carried by said photosensitive element and said second element, to develop said silver halide emulsion and provide a diffusion transfer image on said image receiving layer, said product including at least one compound represented by the formula



wherein X represents the nonmetallic atoms necessary to form a nucleus which completes a 5- or 6-membered heterocyclic moiety on said structure, R is H, an alkali metal or an group which is cleavable in said aqueous alkaline processing composition and R_1 is either a group which has a pKa of from about 7 to about 14 which is ionizable to an anion and wherein the silver salt of the mercaptan resulting from cleavage or ioniza-

tion of —SR is more soluble in said aqueous alkaline processing composition in the pH range within which R_1 is ionized to an anion than said silver salt is below that pH range, or a precursor,

wherein said processing composition initially has a pH substantially equal to or above the pKa of R_1 and said means for lowering the pH of an aqueous alkaline processing composition is adapted to lower the pH of said aqueous alkaline processing composition below the pKa of R_1.

4,390,614

COLOR FACSIMILE PRINTING DEVICE COMPRISING PHOTOSENSITIVE INK IN PORES

Richard M. Peck, 3113 Club Dr., Allentown, Pa. 18103; Robert B. Reif, Grove City, and Loren R. Albrechtson, Columbus, both of Ohio, assignors to Richard M. Peck, Allentown, Pa.

Filed Mar. 16, 1981, Ser. No. 244,523

Int. Cl.³ G03C *11/12, 1/76, 1/40*

U.S. Cl. 430—252 **32 Claims**

1. A printing device comprising a printing element and an ink having photosensitivity and the ability to be transferred to a substrate, wherein said printing element comprises pores having openings at a printing surface of said element and said ink is disposed within said pores and is restricted from lateral movement within the element.

4,390,615

COATING COMPOSITIONS

Robert W. Courtney, 8, Greenoak Rise, Biggin Hill, Kent; Stephen J. Parker, 33 Gillmans Rd., Orpington, Kent, and Alan C. Threadgold, 23, Stuart Close, Swanley, Kent, all of England

Continuation of Ser. No. 91,543, Nov. 5, 1979, abandoned. This application Dec. 9, 1981, Ser. No. 329,054

Int. Cl.³ H05K *3/28*

U.S. Cl. 430—315 **3 Claims**

1. A method of forming a pattern of solder upon a layer of an electrically conductive metal supported on an electrically non-conductive substrate by providing the metal layer with a patterned solder resist coating, whereby portions of the metal layer are coated with the solder resist coating and other parts of the metal layer are not so coated, and contacting the metal layer provided with the solder resist coating with molten solder whereby solder adheres to the portions of the metal layer not coated with the solder resist coating, in which the solder resist coating is formed by polymerizing, by image-wise exposure to actinic radiation, a photopolymerizable coating and wherein unexposed portions of said photopolymerizable coating is removed by a solvent, the improvement consisting essentially of the steps of:

(1) applying a coating composition comprising:

(a) an ethylenically unsaturated polymerizable reaction product of an aromatic polyepoxide and an ethylenically unsaturated carboxylic acid and principally expoxy acrylate, which product is solid or semi-solid in nature;

(b) an inert inorganic filler, the said filler and the said polymerizable raaction product being present in a weight ratio of from 20 to 65 parts by weight of filler to from 80 to 35 parts by weight of polymerizable reaction product;

(c) a photopolymerization initiator for the said polymerizable reaction product; and

(d) a volatile organic solvent for the said polymerizable reaction product;

(2) allowing said coating composition to dry; and

(3) removing said unexposed positions of said polymerizable coating.

4,390,616

IMAGE RECORDING MEMBERS

Kozo Sato; Ken Iwakura, both of Minami-ashigara, and Akira Igarashi, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

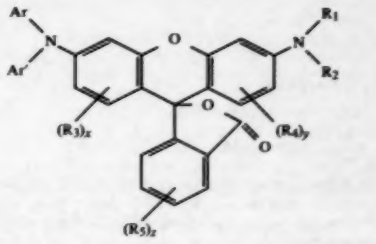
Filed Dec. 1, 1980, Ser. No. 212,010

Claims priority, application Japan, Nov. 30, 1979, 54-155117

Int. Cl.³ G03C *1/52*

U.S. Cl. 430—338 **19 Claims**

1. An image recording member containing, in combination with a color developing electron acceptor, as a dye precursor a diarylaminofluoran compound represented by the formula (I)



(I)

wherein

Ar and Ar' each represent an aryl group or a heterocyclic ring, or Ar and Ar' together can form a heterocyclic ring,

R_1 and R_2 each represent hydrogen, an alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, or a heterocyclic ring, or R_1 and R_2 together form a heterocyclic ring,

R_3, R_4 and R_5 each represent an alkyl group, an alkoxy group, a halogen atom, a nitro group, an amino group, an alkylamino group, a dialkylamino group, or an acylamino group,

x and y are each 0 or an integer of from 1 to 3, and

z is 0 or an integer of from 1 to 4.

4,390,617

METHOD FOR THE FORMATION OF PHOTOGRAPHIC IMAGES

Kenichiro Okaniwa; Toyoaki Masukawa; Kiyoshi Yamashita, and Wataru Ishikawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,806

Claims priority, application Japan, Mar. 18, 1980, 55-35095

Int. Cl.³ G03C *5/24*

U.S. Cl. 430—350 **11 Claims**

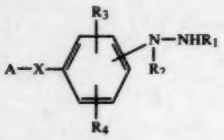
1. A method for forming a photographic image comprising imagewise exposing a silver halide photographic material which has at least one hydrophilic layer containing a reducing agent for silver halide or a precursor thereof coated on a support, and heating the exposed silver halide photographic material in the presence of a compound that generates base upon the application of heat and represented by the formula $M_iH_m(PO_n)_j \cdot jH_2O$ wherein M is Li, Na, K, Rb, Be, Mg, Ca, or Ba, l and i individually are integers from 1 to 3, m is an integer from 0 to 4, n is 3 or 4 and j is an integer from 0 to 12.

4,390,618
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hidetoshi Kobayashi; Toshirou Takahashi; Shigeo Hirano; Takeshi Hirosa, and Keiichi Adachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

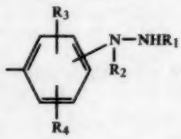
Filed Mar. 15, 1982, Ser. No. 357,930
Claims priority, application Japan, Mar. 13, 1981, 56-36051
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—543 **4 Claims**

1. A silver halide photographic light-sensitive material comprising a layer containing a coupler compound represented by formula (II)



(II)

wherein A represents a residue of a compound capable of undergoing coupling reaction with an oxidation product of an aromatic primary amine developing agent by the removal of one hydrogen atom from the active portion of the said compound; R_1 represents a formyl group, an acyl group, a sulfonyl group, an alkoxycarbonyl group, a carbamoyl group, or a sulfamoyl group; R_2 represents a hydrogen atom, an acetyl group, an ethoxycarbonyl group, or a methanesulfonyl group; each of R_3 and R_4 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, or a halogen atom; and X represents a divalent linking group bonding A to



through a hetero atom.

4,390,619
LEUKOCYTE OR PLATELET STORAGE USING ION-EXCHANGE RESINS

Denise Harmening-Pittiglio, Silver Spring, Md., assignor to James Clifford Haight, Gaithersburg, Md.

Filed Sep. 28, 1981, Ser. No. 306,322
Int. Cl.³ A61K *35/14*
U.S. Cl. 435—2 **20 Claims**

1. In a composition of matter consisting essentially of metabolizing leukocytes or platelets in an in vitro environment capable of supporting platelet metabolism, the improvement which comprises a water-insoluble polymer containing releasable phosphate or bicarbonate ions for supplying a physiologically acceptable, continuous, sustained release source of buffer to said platelets in an amount sufficient to maintain both pH and ATP levels equal to at least 60% of those of freshly prepared platelets for a storage period of at least 7 days of storage at 22° C.

4,390,620
METHOD AND COMPOSITION FOR THE DETECTION AND STUDY OF CELLULAR ACTIVITY OR THE LIKE AND MEANS FOR APPLYING SUCH METHOD

Guy-Alain Junter; Jean-Francois Lemeland; Eric Selegny, and Jean-Claude Vingent, all of Rouen, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 921,706, Jul. 3, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 216,911
Claims priority, application France, Jul. 4, 1977, 77 20538
Int. Cl.³ C12Q *1/00, 1/29, 1/04, 1/06*
U.S. Cl. 435—4 **97 Claims**

1. A method for determining the presence or absence of cells, cellular fractions or organites in a liquid medium, said method comprising:

(1) mixing

(A) a liquid medium having sufficient ionic conductivity to permit potentiometric measurements, a pH buffered about 7.0, and containing an energy substrate selected from those which cells, cellular fractions or organites are known to metabolize by at least one metabolic route with

(B) an electron transporter having an initial ratio of oxidized to reduced forms selected from those electron transporters which are a known part of at least one of said metabolic routes, whereby the metabolic activity of the cells, cellular fractions or organites induces a change in the initial ratio of oxidized to reduced form of said electron transporter causing a change in potential of said liquid medium, and

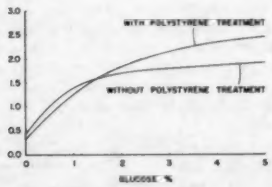
(2) measuring the potential of the medium as a function of time to determine the change in potential which resulted from said change in the ratio of oxidized to reduced form of the electron transporter, said change in ratio having resulted from the metabolic activity of cells, cellular fractions or organites during the time period over which measurements were made, and

(3) relating the change in potential to the presence or absence of cells, cellular fractions or organites in the liquid medium at the time when the measurements were commenced.

4,390,621
METHOD AND DEVICE FOR DETECTING GLUCOSE CONCENTRATION

Robert Bauer, Bristol, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 216,529, Dec. 15, 1980, Pat. No. 4,336,330. This application Mar. 1, 1982, Ser. No. 353,748
Int. Cl.³ G01N *33/50*; C12Q *1/54*
U.S. Cl. 435—14 **7 Claims**



THE INFLUENCE OF A POLYSTYRENE TREATMENT ON QUANTITATION

5. A method for determining the glucose concentration in a test sample containing from about ½ to 10 percent glucose which comprises the steps of providing a test device which includes a carrier having inpregnated therein an enzymatic testing composition comprising glucose oxidase, peroxidase, and a chromogen; subsequently impregnating the carrier with

from 0.5 percent to 1.5 percent by weight of a solution of polystyrene; contacting said test sample with the carrier of said test device; and observing a detectable response, whereby the glucose concentration is determined.

4,390,622

NEISSERIA BACTERIA SPECIES IDENTIFICATION AND BETA LACTAMASE TESTING METHODS

Garry W. Cartwright, 2227 Flat Creek, Richardson, Tex. 75080

Filed Sep. 21, 1981, Ser. No. 303,725
Int. Cl.³ C12Q *1/34, 1/38, 1/36;* C13Q *1/12*
U.S. Cl. 435—18 35 Claims

1. A method for providing rapid, high intensity, visual indication of the presence of Neisseria bacteria species in a specimen comprising: the steps of admixing the specimen with a peptone buffer and pH indicator reagent system to form a specimen suspension, contacting the reagent system specimen suspension with at least one carbohydrate substrate taken from the class consisting of glucose, maltose, sucrose and lactose, permitting the reagent system specimen to react with the contacted carbohydrate substrate, and visually observing the reaction results for color change in a predetermined time period.

4,390,623

SERUM-FREE AND MITOGEN-FREE T-CELL GROWTH FACTOR AND PROCESS FOR MAKING SAME

Hans-Ake Frabricius, Breisach, and Roland Stahn, Holzhausen, both of Fed. Rep. of Germany, assignors to Hooper Trading Company, Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 193,112, Oct. 2, 1980, abandoned. This application Mar. 26, 1981, Ser. No. 247,769
Int. Cl.³ C12P *21/00*
U.S. Cl. 435—68 13 Claims

1. A process for producing a serum-free and mitogen-free T-cell growth factor comprising:

(1) separating peripheral mononuclear blood cell from a donor;

(2) stimulating the cells by incubating the cells in a liquid tissue culture medium supplemented with serum and a mitogen;

(3) separating and washing the stimulated cells to remove substantially all of the serum and mitogen; and

(4) conditioning the cells obtained in step (3) by incubating the cells in the presence of a serum-free and mitogen-free liquid tissue culture medium to thereby transfer the T-cell growth factor into the liquid phase.

4,390,624

PREPARATION OF PROLINE FROM ALGAE

Richard I. Leavitt, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 10, 1981, Ser. No. 329,224
Int. Cl.³ C12P *13/24;* C12R *1/89*
U.S. Cl. 435—107 11 Claims

1. A process for the production of L-proline in high amounts which comprises cultivating Chlorella sp. 580 algae under high intensity illumination in an aqueous growth medium containing an amount sufficient of nutrients including nitrogen to effect growth of the algae and a high concentration of sodium chloride of up to 1M under an aerobic condition, providing an adequate supply of carbon in the form of CO_2 in a depth not exceeding approximately 20cm of the aqueous medium for a period of time until the density of the algae substantially prevents the utilization of CO_2 by the algae to produce L-proline and thereafter continuing to cultivate the algae in the absence of light and CO_2 while providing acetate ion to the medium in an amount sufficient to produce high amounts of L-proline within the algae for a period of time until algae of high L-proline content are obtained, harvesting the algae and recovering from same the L-proline thus produced.

4,390,625

METHOD FOR CONTROLLING THE AMOUNT AND DISTRIBUTION OF ALKALOIDS FORMED IN A FERMENTATION PROCESS

Eva Udvardy Nagy nee Cserey Pechany; Miklos Budai; Gyorgy Fekete; Sandor Görög; Bulcsu Herenyi; Geza Wack, and Karoly Zalai, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed Feb. 6, 1981, Ser. No. 232,173
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.³ C12P *17/18;* C12R *1/645*
U.S. Cl. 435—119 3 Claims

1. A fermentation process for the preparation of ergot alkaloids which comprises:

cultivating a *Claviceps purpurea* variant strain capable of producing primarily ergocornine, alpha-ergocryptine and beta-ergocryptine, while submerged in a liquid aerated culture broth containing carbon and nitrogen sources, at a temperature of 20°–26° for 4 to 8 days at a pH between 5.4 and 6.8;

employing *Claviceps purpurea* MNG 00186 as the *Claviceps purpurea* variant strain capable of producing primarily ergocornine, alpha-ergocryptine and beta-ergocryptine; and

adding to said culture broth a sufficient amount of a compound selected from the group consisting of a C_4 to C_6 keto acid, a C_4 to C_6 hydroxy acid, or a C_4 to C_6 amino acid, wherein said compound is (a) a bioprecursor of isoleucine, or (b) a compound having the ability to promote the formation of isoleucine, to obtain a higher yield of said ergot alkaloids as well as to increase the percentage of the beta-ergocryptine in said ergot alkaloids.

4,390,626

IMMOBILIZED AMINOACYLASE

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto; Takao Mori, Takatsuki, and Motoki Fujimura, Kyoto, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jul. 29, 1981, Ser. No. 288,170
Claims priority, application Japan, Aug. 13, 1980, 55-112024
Int. Cl.³ C12N *11/08, 11/06, 11/14;* C12P *13/04*
U.S. Cl. 435—176 10 Claims

1. An immobilized aminoacylase preparation which consists essentially of aminoacylase and a water-insoluble porous anion exchanger selected from the group consisting of trimethylammonium-introduced styrene resin and trimethylammonium-introduced silica, wherein the water-insoluble porous anion exchanger has a pore size of about 150 to 3,000 Å, pore volume of about 0.3 to 1.0 ml/g, specific surface area of about 10 to 150 m^2/g, and particle size of about 0.1 to 1.2 mm, the aminoacylase being bonded to the porous anion exchanger and cross-linked with an aliphatic dialdehyde having 2 to 6 carbon atoms.

4,390,627

IMMOBILIZATION OF THE SUCROSE MUTASE IN WHOLE CELLS OF PROTAMINOBACTER RUBRUM

Oreste J. Lantero, Jr., Goshen, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 26, 1981, Ser. No. 315,191
Int. Cl.³ C12N *11/08;* C12P *19/12;* C12N *11/02, 11/06*
U.S. Cl. 435—180 5 Claims

1. A method for the immobilization of the sucrose mutase in a microorganism of the species *Protaminobacter rubrum* which comprises the steps of:

(a) providing an aqueous medium containing the microorganism cells;

(b) adding tannic acid to the aqueous medium in an amount of from 5 to 25 weight percent of the microorganism cells;

(c) adding polyethylenimine of a molecular weight of from about 300 to 100,000 to the aqueous medium in an amount

of from about 2 to 25 weight percent of the microorganism cells;

(d) adding an adduct of an epihalohydrin/polyamine copolymer which is a water soluble cationic polymer obtained by the polymerization of an epihalohydrin with an alkylene polyamine having the formula $R_1R_2NRNH_2$ wherein R is a lower alkylene having from 2 to about 6 carbon atoms, and R_1 and R_2 are each a lower alkyl of from about 1 to about 6 carbon atoms, the mole ratio of epihalohydrin to polyamine being from about 0.60:1 to about 2.7:1, said polymerization comprising reacting with the alkylene polyamine from about 50 to about 90 percent of the amount of epihalohydrin to be polymerized, allowing the reaction to continue until the reaction medium attains a substantially uniform viscosity, and reacting the remaining portion of the epihalohydrin incrementally to obtain the cationic polymer, the temperature of polymerization being from about 60° C. to about 120° C. and glutaraldehyde wherein the weight ratio of copolymer to glutaraldehyde in the adduct is from 1:3.3 to 8.6:1 and the adduct's weight percent of the microorganism cells is from 25 to 95 to form a reaction product;

(e) removing the reaction product from the aqueous medium; and

(f) drying the reaction product.

4,390,628

PROCESS FOR ISOLATING CU, ZN-SUPEROXIDE DISMUTASE FROM AQUEOUS SOLUTIONS CONTAINING SAID ENZYME TOGETHER WITH ACCOMPANYING PROTEINS

Jack T. Johansen, Rungsted Kyst, Denmark, assignor to De Forenede Bryggerier A/S, Copenhagen, Denmark

Continuation-in-part of Ser. No. 315,392, Oct. 27, 1981, which is a continuation of Ser. No. 149,383, May 13, 1980, abandoned.
This application Nov. 10, 1981, Ser. No. 320,156
Claims priority, application Denmark, May 17, 1979, 2033/75; Apr. 21, 1980, 1687/80
Int. Cl.³ C12N 9/02
U.S. Cl. 435—189 3 Claims

1. A process for isolating Cu,Zn-superoxide dismutase (SOD) from aqueous solutions containing said enzyme together with accompanying proteins, characterized by subjecting the solution at a pH of 4.7 to 5.0 to chromatography on a cation exchange resin of the same polarity as SOD in the pH range used.

4,390,629

POLYPEPTIDE DEGRADING ENZYMES

Alfred L. Goldberg, Brookline; K. H. Sreedhara Swamy, Allston, and Chin H. Chung, Chestnut Hill, all of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Mar. 30, 1981, Ser. No. 249,104
Int. Cl.³ C12N 9/52, 9/48; C12R 1/19, 1/42
U.S. Cl. 435—220 2 Claims

1. A method of preparing a proteinaceous mixture having proteolytic activity and containing proteases Do, Re, Mi, Fa, and Pi, said method comprising

providing a culture of cells of *E. coli* or a species of Salmonella or Shigella,

breaking open said bacterial cells to form a cell homogenate,

removing water-insoluble cellular components from said homogenate to form an extract containing solubilized protein,

fractionating the protein of said extract, and

isolating said fraction exhibiting proteolytic activity and containing protease, Do, Re, Mi, Fa, and Pi, said fraction comprising said proteinaceous mixture.

4,390,630

HEMENTIN--A FIBRINOLYTIC AGENT

Roy T. Sawyer, Penclawdd, Wales; Gunther S. Stent, Kensington, Calif.; Andrei Z. Budzynski, Glenside, and Stephanie A. Olexa, Hellertown, both of Pa., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 28, 1980, Ser. No. 201,655
Int. Cl.³ C12N 9/64, 9/48, 9/50; A61K 37/54
U.S. Cl. 435—226 5 Claims

1. Hementin, a polypeptide of between about 80 to about 85 kdal isolated from *Haementeria ghilianii*, characterized by having cathodic electrophoretic mobility on cellulose acetate in a 0.075 M sodium veronal buffer, pH 8.6; having anticoagulant activity which activity is independant of the inactivation of thrombin; and by having the ability to dissolve previously formed fibrin clots and having activity toward fibrinogen different from plasmin.

4,390,631

PROCESS FOR PRODUCING BACTERIA HAVING HIGH NITRILASE ACTIVITY

Ichiro Watanabe; Kanehiko Enomoto, both of Yokohama, and Yasuo Ogawa, Kawasaki, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1981, Ser. No. 307,268
Claims priority, application Japan, Sep. 30, 1980, 55/135120
Int. Cl.³ C12N 1/38; C12P 13/02; C12N 9/78, 1/20
U.S. Cl. 435—244 5 Claims

1. A process for producing bacteria having a high nitrilase activity comprising incubating bacteria having an ability to produce nitrilase, wherein the improvement comprises using a culture medium containing a water soluble iron compound in an amount of at least 0.2 mg/l as iron.

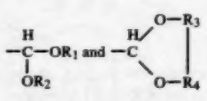
4,390,632

STABILIZATION PROCESS FOR BIOLOGICAL CELLS AND STABILIZED COMPOSITIONS THEREOF

James H. Carter, II, Ft. Lauderdale, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jul. 14, 1980, Ser. No. 167,803
Int. Cl.³ G01N 33/48
U.S. Cl. 436—10 19 Claims

1. A stabilized biological cell composition treated to comprise at least one acetal radical selected from the group consisting of



wherein R_1, R_2, R_3 and R_4 are groups having 1 to about 6 carbon atoms.

4,390,633

DETERMINING REPRODUCTIVE STATUS OF MAMMALS WITH NMR OF CERVICAL MUCUS

Charles P. Merilan, and Jerald R. Sears, both of Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

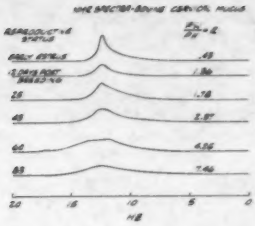
Filed Jul. 24, 1981, Ser. No. 286,593
Int. Cl.³ G01N 33/48, 24/08
U.S. Cl. 436—65 8 Claims

1. The method for determining pregnancy or reproductive status in a mammal which comprises the steps of:

a. obtaining at periodic time intervals mucus samples from the cervix of a mammal whose reproductive status is to be determined;

b. obtaining nuclear magnetic resonance spectra of said samples;

c. determining the nuclear magnetic resonance ratios from said spectra on the basis of the relationship



$$\frac{\text{peak width at half amplitude}}{\text{peak height}}$$

and

d. evaluating the reproductive status of said mammal from said ratios.

4,390,634

CALCIUM FLUOROPHLOGOPITE GLASS-CERAMICS

Syed N. Hoda, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,001
Int. Cl.³ C03C 3/22
U.S. Cl. 501—3 **3 Claims**

1. A glass-ceramic article which is machinable with hand and machine tools, exhibits high mechanical strength, good resistance to attack by acids and alkalies, excellent dielectric properties, and which does not swell when immersed into water nor develop cracks during the crystallization process having a base composition which is essentially free from alkali metal and which consists essentially, expressed in terms of weight percent on the oxide basis, of about 35–60% SiO_2, 5–20% Al_2O_3, 15–35% MgO, 5–20% CaO, and 5–15% F, which is nucleated with 0.5–4% SrO+BaO, consisting of 0–3.0% SrO and 0–4.0% BaO, or, if SrO and/or BaO are absent, with 8–15% TiO_2, said article containing not more than 10% by volume residual glass and wherein calcium fluorophlogopite is essentially the sole crystal phase when nucleated with 0.5–5.0% SrO+BaO and wherein calcium fluorophlogopite and a minor amount of rutile are essentially the sole crystal phases present when nucleated with 8–15% TiO_2.

4,390,635

ALKALI METAL ALUMINOBOROSILICATE PHOTOCHROMIC GLASSES

David W. Morgan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,199
Int. Cl.³ C03C 3/26, 3/08
U.S. Cl. 501—13 **2 Claims**

1. A green transparent photochromic glass wherein crystals of silver chloride and silver bromide sensitized with copper impart the photochromic behavior to the glass and wherein over 50% of the copper is present as Cu^+ ions, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 0–2.5% Li_2O, 0–9% Na_2O, 0–17% K_2O, and 0–8% Cs_2O, the sum of $Li_2O+Na_2O+K_2O+Cs_2O$ being 8–20%, 5–25% Al_2O_3, 14–23% B_2O_3, 40–65% SiO_2, 0.004–0.02% CuO, 0.15–0.3% Ag, 0.1–0.25% Cl, 0.1–0.2% Br, the molar ratio alkali metal oxide:B_2O_3 ranging between about 0.55–0.85, where the composition is essentially free from divalent metal oxides other than CuO, the weight ratio Ag:(Cl+Br) ranging between about 0.65–0.95, about 0.03–0.25% Cr_2O_3, and about 0.05–0.3% As_2O_3 and/or Sb_2O_3, as analyzed in the glass.

4,390,636

GLASS FRIT OF DIOPSIDE CRYSTAL PRECURSORS

Werner F. Votava, Broadview Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 188,919, Sep. 19, 1980, Pat. No. 4,337,316. This application Mar. 5, 1982, Ser. No. 353,286
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.
Int. Cl.³ C03C 1/00, 1/04
U.S. Cl. 501—24 **3 Claims**

1. A substantially completely vitreous, smelted, clear glass frit containing:

(a) leachable amounts of deflocculent oxides and flocculent alkaline earths and adapted to serve as a ceramic body flux in a ceramic slip without thickening the slip to an unworkable viscosity,

(b) said frit being completely liquid at a smelting temperature of about 2600° F. to about 2750° F. and containing in solution the diopside precursors CaO, MgO, and SiO_2, said frit consisting essentially of the following components, said diopside precursors comprising at least 35% by weight of said frit:

CaO: 6.27 to 23.9
MgO: 4.45 to 18.4
SiO_2: 46.0 to 60.92
Additive: 5 to 20

said additive being selected from one or more of the following in approximately the percent indicated based on the total weight of the glass:

K_2O: 1.4 to 1.54
Na_2O: 2.5 to 9.1
Li_2O: 0.1 to 1.19
Al_2O_3: 6.7 to 11.32

(c) said frit being adapted upon heating to crystallize from solution at least a fluxing amount of said precursors in the form of fine diopside crystals having an average particle size less than one micron and being substantially free of unreacted alkaline earths, and

(d) said deflocculent oxides and flocculent alkaline earths being leachable from said frit in sufficient relative amounts to counterbalance each other and prevent said thickening of the slip to an unworkable viscosity, and

(e) the foregoing composition containing additionally

B_2O_3: 2.88 to 4.98
P_2O_5: 3.5 to 3.61

4,390,637

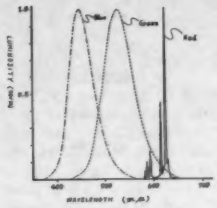
X-RAY ABSORBING GLASS FOR A COLOR CATHODE RAY TUBE HAVING A CONTROLLED CHROMATICITY VALUE AND A SELECTIVE LIGHT ABSORPTION

Nobutaka Daiku, Otsu, Japan, assignor to Nippon Electric Glass Company, Limited, Otsu, Japan

Filed Sep. 9, 1981, Ser. No. 300,588
Claims priority, application Japan, Sep. 10, 1980, 55-126344; Jan. 29, 1981, 56-12676
Int. Cl.³ C03C 3/10
U.S. Cl. 501—64 **5 Claims**

1. A glass for use in color cathode ray tube having the composition essentially consisting, by weight, of 50–75% SiO_2, 0–5% Al_2O_3, 0–4% CaO, 0–3% MgO, 0–13% SrO, 0–16% BaO, 0–3% PbO, 0–3% ZnO, 0–4% ZrO_2, the sum of SrO+-

$BaO+PbO+ZnO+ZrO_2$ being 5–25%, 0–4% Li_2O, 3–15% Na_2O, 2–15% K_2O, the sum of Na_2O+K_2O being 5–20%,



0–2% TiO_2, 0–3% CeO_2, 0.1–5.0% Nd_2O_3, 0.0005–0.05% Cr_2O_3, and 0–2% Pr_6O_{11}.

4,390,638

ACIDPROOF, HYDROLYSIS-RESISTANT OPTICAL AND OPHTHALMIC GLASS OF LOW DENSITY

Karl Mennemann, Taunusstein; Georg Gliemeroth, and Volkmar Geiler, both of Mainz-Finthen, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,787

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026605

Int. Cl.³ C03C *3/08, 3/10*

U.S. Cl. 501—77 **14 Claims**

1. An optical ophthalmic glass having an index of refraction of ≧1.69, an Abbe number of ≧37, and a density of ≦3.30 g/cm³, consisting essentially of (in % by weight):

SiO_2	18–36
B_2O_3	3–18
GeO_2	0–8
Al_2O_3	0–6,
wherein $SiO_2 + B_2O_3 + Al_2O_3 + GeO_2$ =	25–39
P_2O_5	0–14,
wherein $SiO_2 + B_2O_3 + Al_2O_3 + GeO_2 + P_2O_5$ =	30–44
Li_2O	0–12
Na_2O	0–14
K_2O	0–18
$Li_2O + Na_2O + K_2O$ =	2–18
MgO	0–15
CaO	7–21.35
MgO + CaO	15–32
SrO	0–13
BaO	0–17
ZnO	0–15
PbO	0–10
SrO + BaO + ZnO + PbO	0–20
TiO_2	3.95–14
Nb_2O_5	0–13
WO_3	0–10
$TiO_2 + Nb_2O_5 + WO_3$ =	10–21
ZrO_2	2.9–15,
La_2O_3	0–20
Y_2O_3	0–16
Gd_2O_3	0–16
Yb_2O_3	0–10
$La_2O_3 + Y_2O_3 + Gd_2O_3 + Yb_2O_3$ =	0–20
Ta_2O_5	0–13
HfO_2	0–6
SnO_2	0–6.

4,390,639

UPGRADING SYNTHESIS GAS

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 21, 1981, Ser. No. 332,773

Int. Cl.³ C07C *1/04, 7/163, 29/15*

U.S. Cl. 518—713 **16 Claims**

1. A process for the upgrading of synthesis gas with good selectivity to olefins and oxygenated hydrocarbons comprising contacting carbon monoxide and hydrogen in the vapor phase at a temperature of at least 250° C. and a pressure of at least 500 psi in the presence of a catalyst of the formula

$$RuO_x/Au_a^*$$

wherein

a=about 0.5 to about 1.5 and

x=number of oxygens needed to satisfy the valence requirements of the other elements.

4,390,640

PROCESS FOR THE PRODUCTION OF OPTIONALLY-FOAMED POLYURETHANES

Werner Rasshofer, Cologne; Geza Avar, Leverkusen; Hans-Albrecht Freitag, Bergisch Gladbach; Gerhard Grögler, Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

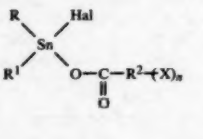
Filed Jan. 25, 1982, Ser. No. 342,303

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3100977

Int. Cl.³ C08G *18/14, 18/24*

U.S. Cl. 521—51 **5 Claims**

1. A process for the production of optionally-foamed polyurethanes comprising reacting polyisocyanates with organic compounds containing at least two isocyanate-reactive hydrogen atoms and having molecular weights from 400 to 10,000 in the presence of activators, characterized in that the activators used are compounds corresponding to the general formula:



in which

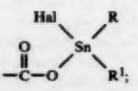
R and R^1 may be the same or different and represent C_1–C_{20}-alkyl, C_5–C_7-cycloalkyl or C_7–C_{30}-alkaryl radicals;

Hal represents a halogen atom;

R^2 represents a halogen atom;

R^2 represents a saturated aliphatic radical containing from 1 to 30 carbon atoms; an unsaturated aliphatic radical containing from 2 to 18 carbon atoms; a cycloaliphatic radical containing from 4 to 7 carbon atoms; or an aromatic radical containing from 6 to 14 carbon atoms;

X represents hydrogen or a group corresponding to the formula



and

n is an integer of from 1 to 3.

4,390,641

FLAME-RETARDANT BENZYLIC-ETHER PHENOLIC MODIFIED FOAM AND METHOD OF PREPARING SAME

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 281,290, Jul. 7, 1981. This application Jan. 4, 1982, Ser. No. 336,681

Int. Cl.³ C08G 18/32; C08J 9/00

U.S. Cl. 521—103 18 Claims

1. A method of preparing a nonfriable, closed-cell, benzylic-ether phenol-formaldehyde modified thermosetting foam product characterized by a low flame spread and smoke properties, which method comprises:

(a) reacting, under substantially anhydrous conditions, 100 parts of a benzylic-ether phenol-formaldehyde resin, having a hydroxyl number of greater than about 200, with from about 50 to 150 parts by weight per 100 parts of the benzylic-ether phenol-formaldehyde resin in the presence of a weak acid catalyst at a pH of from about 4.0 to 6.5, to form a benzylic-ether phenol resin prepolymer; and

(b) reacting the prepolymer, in the presence of a blowing amount of a blowing agent to form a foamable mass, and a catalytic amount of an organometallic catalyst, which is not affected by the pH of the prepolymer, with from about 50 to 200 parts by weight of a methylene diphenyl polyisocyanate in an exothermic reaction, to provide for the further heat and acid condensation of the phenolic resin prepolymer and the reaction of the isocyanate with the prepolymer, to produce a low-friability, substantially closed-cell, phenolic modified thermosetting foam product composed substantially of acid methylene linkages.

4,390,642

FLAME-RETARDANT, THERMOSETTING FOAM PRODUCT AND METHOD OF PREPARING SAME

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 238,467, Feb. 26, 1981, Pat. No. 4,350,776. This application Jul. 7, 1981, Ser. No. 281,290

Int. Cl.³ C08G 18/32

U.S. Cl. 521—112 13 Claims

1. A method of preparing a thermosetting foam product, which method comprises: reacting 100 parts of a phenol-formaldehyde resin having a mole ratio of phenol to formaldehyde of from about 1:1.2 to 1:2.0 with from about 10 to 90 parts of a furfural-alcohol polymer, and with from 50 to 250 parts of melamine, and with from 50 to 250 parts of methylene diphenyl isocyanate, the reaction carried out in the presence of a blowing agent, and a catalytic amount of an isocyanate trimerization catalyst, to provide a substantially closed-cell thermosetting foam characterized by low friability and high structural strength and with good flame and heat properties.

4,390,643

PROCESS FOR PRODUCING AMINE FORMALDEHYDE RESIN FOAM

Toshiaki Kanada, Matsudo; Kazuhiro Suzuki; Hiroshi Yoshioka, both of Tokyo; Kenji Maeda, and Yoshihiro Tsurumi, both of Kanamachi, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 124,907, Feb. 26, 1980, abandoned. This application Sep. 3, 1981, Ser. No. 299,168

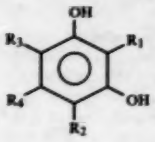
Claims priority, application Japan, Feb. 26, 1979, 54-21604; Nov. 28, 1979, 54-153812; Nov. 28, 1979, 54-153813

Int. Cl.³ C08J 9/14

U.S. Cl. 521—117 10 Claims

1. A process for producing amine formaldehyde resin foam by using a precondensate for the amine formaldehyde resin, foaming agent, a surfactant and a curing agent, characterized in that the foaming agent is selected from the group consisting of aliphatic hydrocarbons, halogenated aliphatic hydrocarbons having a boiling point in the range of from about −30° C. to about 30° C. or mixtures thereof, and the foaming agent being used in amount of from about 0.07 mol to about 1.0 mol per 100 g of solid content of the precondensate for amine formaldehyde resin, and

wherein the foaming system further contains at least one modifier selected from the group consisting of a compound represented by the formula:



I

wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen and alkyl having 1–3 carbon atoms, and R_4 is selected from the group consisting of hydroxyl, hydrogen and alkyl having 1–3 carbon atoms; mixtures of the compounds of formula I; a condensate of each of the compounds of formula I and formaldehyde; and mixtures of the condensate and the compound of formula I, the process comprising

mixing the precondensate, the foaming agent, the modifier and the surfactant under such conditions that the foaming agent is maintained liquid,

emulsifying the resulting mixture at a temperature which is at least 0° C. and higher than the boiling point of the foaming agent by 5°–50° C. and at such a pressure that the foaming agent is maintained liquid at said temperature,

while or after mixing the resulting emulsified mixture with the curing agent, transferring the resulting mixture to an environment having atmospheric pressure or depressurizing the mixture to atmospheric pressure at a temperature which is between 0° and 35° C. and higher than the boiling point of the foaming agent to foam the mixture.

4,390,644

ISOCYANURATE FOAMS USING A SULFONIUM ZWITTERION/METAL CARBONYLATE MIXTURE AS CATALYST

Donald H. Clarke, Essexville; George J. Pomranky, and Donald L. Schmidt, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

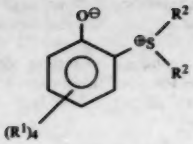
Filed May 18, 1981, Ser. No. 264,503

Int. Cl.³ C08G 18/14, 18/16, 18/58, 18/65

U.S. Cl. 521—121 18 Claims

1. A process for preparing a foamed polymer having isocyanurate moieties and moieties that are adducts of isocyanate moieties and active hydrogen moieties, which comprises reacting an organic polyisocyanate having a plurality of isocyanate moieties or a mixture of organic polyisocyanates with (a) an active hydrogen compound having a plurality of active hydrogen moieties and (b) a compound containing oxirane groups in the presence of a blowing agent and a catalyst, the catalyst comprising an ortho-sulfonium phenoxide, which is soluble in the polyisocyanate or mixture of polyisocyanates, and a carbonylate salt, under conditions such that the phenoxide and the carbonylate salt initiate reaction of the active hydrogen compound, the compound containing oxirane groups and the polyisocyanate or mixture of polyisocyanates to form a foamed polymer having isocyanaurate moieties and adducts of isocyanate moieties and active hydrogen moieties.

17. An ortho-sulfonium phenoxide represented by the formula:



wherein each R^1 is independently a suitably inert monovalent radical capable of existing as a substituent on the benzene ring provided that at least one R^1 is an organic radical containing at least four carbon atoms; and each R^2 is independently a suitably inert monovalent radical and/or two of R^2 are collectively a suitably inert divalent organic radical capable of forming a heterocyclic ring with S^+.

4,390,645

STABLE DISPERSIONS OF POLYMERS IN POLYFUNCTIONAL COMPOUNDS HAVING A PLURALITY OF ACTIVE HYDROGENS AND POLYURETHANES THEREFROM

Dwight K. Hoffman; Robert F. Harris; Nancy B. Tefertiller, all of Midland, Mich., and Randall C. Rains, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1979, Ser. No. 97,070
Int. Cl.³ C08G *18/14, 18/63*
U.S. Cl. 521—137 **9 Claims**

1. A copolymer dispersion which is stable and which comprises:

(A) a polyahl having dispersed therein;

(B) an addition copolymerizate of (1) an adduct of a polyahl and an active ethylenically unsaturated isocyanate with (2) at least one other ethylenically unsaturated monomer; or

(C) an adduct of (1) a polyahl and (2) an addition copolymer of an active ethylenically unsaturated isocyanate with at least one other ethylenically unsaturated monomer which is nonreactive with the isocyanate; or

(D) a mixture of (B) and (C); or

(E) a mixture of (B) and/or (C) and a polymer of at least one other ethylenically unsaturated monomer.

4. A polyurethane composition which is the reaction product of the copolymer dispersion of claim 1 and an organic polyisocyanate.

4,390,646

ERASABLE INKS CONTAINING THERMOPLASTIC BLOCK COPOLYMERS

Edward J. Ferguson, Avon, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 5, 1981, Ser. No. 318,305
Int. Cl.³ C08L *53/00;* **C08K** *5/01;* **C09D** *11/18*
U.S. Cl. 523—161 **5 Claims**

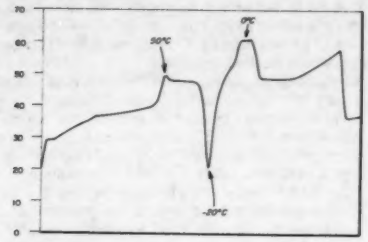
1. An erasable ink for use in a ball-point writing instrument comprising a pigmented organic solvent solution containing a thermoplastic block copolymer having an arrangement of A (thermoplastic) and B (rubbery) blocks selected from the class consisting of ABA, $(AB)_nX$ and $(—AB)—_n$; in which said thermoplastic blocks are selected from the class consisting of styrene, ester and urethane blocks; in which said rubbery blocks are selected from the class consisting of butadiene, isoprene and ethylene-butylene blocks; in which the ratio of said rubbery blocks to said thermoplastic blocks is from 60:40 to 90:10; and in which the solubility parameter of said organic solvent is from about 7 to about 10.5.

4,390,647

NON-STARCH CONTAINING AQUEOUS SIZING COMPOSITION FOR GLASS FIBERS AND SIZED GLASS FIBERS FOR USE IN REINFORCING ELASTOMERS

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 27, 1981, Ser. No. 238,724
Int. Cl.³ C08L *91/06;* **C03C** *25/02;* **C08K** *9/06*
U.S. Cl. 523—212 **12 Claims**



1. An aqueous non-starch-containing composition for treating glass fibers to produce treated glass fibers to be further treated with an aqueous adhesive coating composition to reinforce elastomeric materials, consisting essentially of:

A. about 0.5 to about 5 weight percent of one or more water dispersible, high molecular weight polyols selected from the group consisting of polyoxy alkylene polyols and polyalkylene polyols having an average molecular weight from about 300 to about 12,000 and mixtures thereof present as flexible film formers,

B. about 0.1 to about 2 weight percent of one or more silane coupling agents,

C. about 0.1 to about 4 weight percent of a cationic lubricant,

D. water in the amount to give a total solids content for the aqueous composition in the range of about 3 to about 20 weight percent.

4,390,648

REINFORCED RUBBERY COMPOSITION

Carl J. Stacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 11, 1980, Ser. No. 158,652
Int. Cl.³ C08K *9/00, 3/34, 3/10*
U.S. Cl. 523—216 **13 Claims**

1. A method for improving the hysteresis of a rubbery composition comprising a rubbery polymer and a silicon containing reinforcing agent, said method comprising the steps of:

adding said silicon containing reinforcing agent to said rubbery polymer in the form of zinc-modified silica which is formed by the steps of adding a suitable acidic material to an alkali metal silicate solution to thereby precipitate silica from said alkali metal silicate solution, adding a suitable zinc salt to the solution formed by the adding of said acidic material to said alkali metal silicate solution to thereby form said zinc modified silica, wherein less than the stoichiometric amount of said acidic material, which would be required to completely neutralize the alkali metal oxide which is present in said alkali metal silicate solution, is added to said alkali metal silicate solution, and wherein said zinc salt is added to the solution formed by the adding of said acidic material to said alkali metal silicate solution after the precipitation of silica from said alkali metal silicate solution is substantially complete; and

curing said rubbery composition.

4,390,649

INJECTION MOLDABLE POLY(ETHYLENE TEREPHTHALATE)

Shaul M. Aharoni, Morris Plains, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 18, 1982, Ser. No. 349,781
Int. Cl.³ C08L 67/02; C08K 3/10
U.S. Cl. 524—167 15 Claims

1. In a molding composition comprising

a. a thermoplastic, saturated, linear polyester of terephthalic acid,

b. a plasticizing material and

c. a crystal nucleating agent, the improvement which consists in using as the nucleating agent a powdered crystalline metal hydroxide of grain size not exceeding 45 microns, selected from the group of hydrated aluminum hydroxide containing 30±5% water of hydration, nickel hydroxide, indium hydroxide and copper hydroxide in an amount sufficient to increase the crystallization temperature of an article molded from the polyester composition by at least about 15° C. with regard to that of the mixture of a and b.

4,390,650

PROCESS FOR MAKING FIBROUS MATERIAL WATER REPELLENT

Hans Deiner, Neusäss, and Willy Bernheim, Diedorf, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,569
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035824
Int. Cl.³ C08L 83/06
U.S. Cl. 524—266 8 Claims

1. A process for making fibrous material water-repellent, which comprises treating the fibrous material with an aqueous bath containing

(A) an emulsified organopolysiloxane with at least 2 modified or unmodified, crosslinkable, hydroxyl groups,

(B) an emulsion of a polysilicic acid ester of a monovalent alcohol with 1 to 4 carbon atoms, which has been emulsified by the aid of a non-ionic emulsifier, and shows a pH-value of 5 to 7.5, and

(C) a reaction product of an organic compound containing at least one halohydrin group or epoxy group or both and an organic compound containing hydrogen atoms bound to nitrogen, which reaction product is water-soluble or at least water-dispersible when in form of its salt.

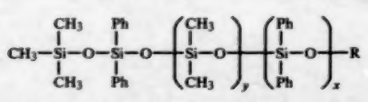
4,390,651

PHENYL-CONTAINING ORGANOPOLYSILOXANES

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 748,739, Dec. 9, 1976, which is a division of Ser. No. 506,007, Sep. 16, 1974. This application Dec. 24, 1981, Ser. No. 334,219
Int. Cl.³ C08K 5/54
U.S. Cl. 524—267 4 Claims

1. A polycarbonate composition comprising in admixture an aromatic polycarbonate and a phenyl-containing organopolysiloxane fluid characterized by the general formula:



wherein Ph is phenyl, wherein x and y have a combined value sufficient to provide a phenyl content of from about 40 to about 80 percent by weight, and R is a mixture of hydrogen and trimethylsilyl sufficient to provide the fluid with a trimethylsiloxy content of from about 12 to 21 percent by weight.

4,390,652

NITRILE BARRIER RESINS CONTAINING FILLERS AND PROCESSING AIDS

Ralph E. Isley, Northfield, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed May 26, 1981, Ser. No. 267,154
Int. Cl.³ C08K 5/15
U.S. Cl. 524—322 16 Claims

1. A composition which comprises a blend of (1) a copolymer produced by the polymerization of a major proportion of a mono-unsaturated nitrile and a minor proportion of another monovinyl monomer component polymerizable therewith; (2) an aliphatic carboxylic acid with 18 or less carbon atoms; and (3) an alkaline filler containing a polyvalent cation.

4,390,653

FLAME-RETARDANT FILLED POLYPROPYLENE COMPOUND WITH IMPROVED FLOW PROPERTIES

Thomas L. Levendusky, Greensburg, and William L. Burton, Natrona Heights, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 22, 1982, Ser. No. 341,904
Int. Cl.³ C08K 3/22, 9/04
U.S. Cl. 524—322 16 Claims

1. A surface modified inorganic filler composition compatible with thermoplastic resins, said composition comprising

(a) a powdered inorganic filler having a median particle size of less than about 15 microns, said filler being selected from the group consisting of alumina hydrate, bauxite and magnesium hydroxide;

(b) about 0.5 to 1.5%, based on the weight of the filler, of a liquid surface modifier for the filler, said liquid surface modifier having a titer below about 20° C. and an iodine value of about 15 or less; and

(c) about 0.8 to 2.4%, based on the weight of the filler, of a solid mixture of C_{14}–C_{20} carboxylic acids, said solid mixture having a titer of about 30° to 70° C. and an iodine value of about 15 or less.

4,390,654

VINYL CHLORIDE POLYMER FLAMEPROOFED AND SMOKE INHIBITED WITH A COPPER PHOSPHATE

Ralf Schüler, Reckliughausen, and Günther Maahs, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,762
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116969
Int. Cl.³ C08K 3/32
U.S. Cl. 524—413 12 Claims

1. A polyvinyl chloride blend comprising a vinyl chloride polymer and an amount of copper (II) hydroxide phosphate of the formula $Cu_3(PO_4)_2.Cu(OH)_2$ effective as a smoke retardant.

4,390,655

STABILIZED ETHYLENE/TETRAFLUOROETHYLENE COPOLYMERS

Jerrel C. Anderson, Vienna, W. Va., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 257,107, Apr. 24, 1981, abandoned. This application May 3, 1982, Ser. No. 374,616
Int. Cl.³ C08K 3/16
U.S. Cl. 524—413 7 Claims

1. An ethylene/tetrafluoroethylene copolymer composition having good thermal stability which comprises (a) an ethylene/tetrafluoroethylene copolymer which contains 40 to 70 mol percent tetrafluoroethylene units and complementally 60–30 mol percent ethylene units and optionally, up to 20 mole percent units of at least one copolymerizable ethylenically unsaturated comonomer of 3–12 carbon atoms, and (b) from 0.05 to 500 ppm, based on parts of (a) and (b), cuprous iodide

or cuprous chloride (as copper) free of other inorganic halide salts.

4,390,656

FLAME-RESISTANT MOLDING COMPOSITIONS

Carlos Weise, Burghausen; Dietrich Wolfer, Untereching, and Jörg Patzke, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,605

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1980, 3002397

Int. Cl.³ C08K *3/04*; C08L *83/06*

U.S. Cl. 524—493 **15 Claims**

1. A flame-resistant molding composition comprising (1) a diorganopolysiloxane which is free of hydrogen and contains at least 90 percent by weight of diorganopolysiloxane units, (2) an organic polymer selected from the group consisting of polymers of ethylene, propylene, isobutylene, methylbutene-1, butene-1, methylpentene-1, isoprene, butadiene, styrene, hexadiene, dicyclopentadiene, ethylidenenorbornene, vinyl chloride, vinylidene chloride, chloroprene, acrylic acid, methacrylic acid, acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, methyl acrylate, methyl methacrylate, ethyl methacrylate, vinyl acetate, vinyl laurate, vinyl alcohols, saponification products of copolymers of ethylene and vinyl acetate, polyvinyl acetals, chlorosulfonated polyethylenes, polyamides, polyimides, polycarbonates, polyurethanes, polyacetals, polyethers, polysulfones, polyesters, polyepichlorohydrins, polycarbodiimides and graft or block copolymers of diorganopolysiloxanes obtained from the polymerization of a diorganopolysiloxane and at least one organic compound having at least one aliphatic carbon-carbon double bond, (3) graphite and (4) a crosslinking agent.

4,390,657

COMPOSITION OF POLYCARBONATE, AN ABS RESIN AND AN ACRYLATE-METHACRYLATE INTERPOLYMER

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 19, 1981, Ser. No. 312,795

Int. Cl.³ C08L *69/00*

U.S. Cl. 524—504 **29 Claims**

1. A thermoplastic molding composition which comprises:
(a) a polycarbonate resin;
(b) a copolymer which comprises acrylonitrile, butadiene and an alkenyl aromatic compound; and
(c) a multiphase composite interpolymer which comprises a C_1–C_5 acrylate and a C_1–C_5 methacrylate.

4,390,658

COATING COMPOSITIONS

Clive W. Graetz, Glen Waverly, Australia; Morice W. Thompson, Cox Green, and Charles Bromley, Bourne End, both of United Kingdom, assignors to Imperial Chemical Industries Limited, London, England and Dulux Australia Limited, Victoria, Australia

Filed Oct. 22, 1980, Ser. No. 199,640

Claims priority, application United Kingdom, Oct. 22, 1979, 7936556

Int. Cl.³ C08L *1/34*

U.S. Cl. 524—512 **9 Claims**

1. A crosslinkable coating composition which is miscible in all proportions with water, the film-forming material in which consists of:
(A) crosslinkable, water-insoluble film-forming acrylic polymer particles of size less than 10 microns which are sterically stabilised in dispersion in a liquid blend of:
(B) at least one water-soluble crosslinking agent for the film-forming polymer, with
(C) at least one water-soluble, non-volatile substance of molecular weight less than 1000 which is capable of participating in the reaction whereby the film-forming polymer is crosslinked but which does not appreciably dissolve or swell the particles of the said polymer, the amount of the crosslinking agent (B) being up to 30% of the total weight of the constituents (A), (B) and (C) and the amount of the non-volatile reactive constituent (C) being up to 40% of the said total weight and the sterically stabilised aqueous dispersion of the acrylic polymer (A) being obtained by the polymerisation of monomers in an aqueous medium in which the monomers are soluble but the resulting polymer is insoluble, in the presence of an amphipathic dispersing agent which contains in the molecule as one component thereof as polymer chain which is solvatable by the liquid blend of the crosslinking agent (B) and the co-reactive substance (C) and as another component thereof a polymer chain which is not solvatable by that blend and which anchors itself to the particles of the polymer (A).

4,390,659

METHOD FOR THE PREPARATION OF QUATERNARY CARBOXAMIDE POLYMERS

Frederick W. Stanley, Jr., and William J. Fairchok, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 10, 1980, Ser. No. 158,095

Int. Cl.³ C08L *61/32*

U.S. Cl. 524—555 **13 Claims**

1. A method for preparing a quaternary carboxamide polymer comprising the step of simultaneously contacting a carboxamide polymer with a lower aldehyde and a secondary amine or the reaction product thereof and at least a portion of a quaternizing agent prior to the substantial reaction to the carboxamide polymer with the aldehyde, secondary amine or their reaction product and at conditions sufficient to prepare a N-[tri(hydrocarbyl or inertly substituted hydrocarbyl)ammonium alkyl]-carboxamide polymer.

4,390,660

ULTRAVIOLET LIGHT ABSORBING COMPOSITIONS

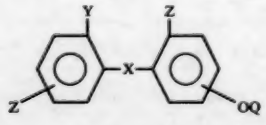
Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 154,621, May 30, 1981, Pat. No. 4,321,400. This application Dec. 9, 1981, Ser. No. 328,922

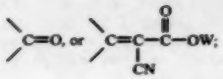
Int. Cl.³ C08K *5/13*, *5/16*

U.S. Cl. 524—721 **8 Claims**

1. An aqueous coating composition, which comprises:
(a) a dispersion of a colloidal silica in a solution of the partial condensate of a silanol having the formula $RSi(OH)_3$, where R is selected from the group consisting of alkyl having 1 to 3 carbon atoms and aryl, at least 70 weight percent of which is $CH_3Si(OH)_3$, in a mixture of an aliphatic alcohol and water, said dispersion containing from 10 to 50 percent by weight of solids, said solids consisting essentially of 10 to 70 percent by weight of the colloidal silica and 30 to 90 percent by weight of the partial condensate, and
(b) an effective amount of an ultraviolet light absorbing agent consisting of a compound having the formula



wherein:
X is >C=O, or



Y is H or OH;

Z is H, OH, OQ or OW, where at least one Z is OH if Y is H;

Q is $-CONH(CH_2)_3Si(R_2)_x(OR_1)_y$ or $-CONH(CH_2)_3Si(R_2)_x(OCOR_1)_y$; and

W is C_mH_{2m+1}

where x=0, 1 or 2, y=1, 2 or 3, x+y=3, and R_1 and R_2, independently, are alkyl having 1 to 6 carbon atoms and m=1 to 18.

4,390,661

NOVEL COMPOSITION AND PROCESS FOR PRODUCING SOLID RESIN THEREFROM

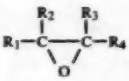
Johann G. Schulz, Pittsburgh, and Daniel Margosian, Verona, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 290,663, Aug. 6, 1981, Pat. No. 4,361,671. This application May 28, 1982, Ser. No. 382,945

Int. Cl.³ C08G *63/42, 63/76, 63/66*

U.S. Cl. 524—878 **59 Claims**

1. A novel composition of matter capable of being cured to a solid resinous material obtained by reacting (1) a coal derivative comprising a mixture of monocyclic, polycyclic, multifunctional carboxylic acids resulting from the interaction of coal with nitric acid with (2) an oxirane defined by the following formula:



wherein R_1, R_2, R_3 and R_4, the same or different, can be hydrogen or an alkyl group having from one to 10 carbon atoms, and then subjecting the resulting reaction product to treatment with hydrogen.

4,390,662

CURABLE RESIN COMPOSITION

Tomonori Ando, Tokyo; Toshiaki Hanyuda, Yokohama; Satohiro Shishido; Fumiaki Sano, both of Kawasaki; Kiyoyuki Ochi, Yokohama; Toshiaki Sugimoto, and Yoshiro Okino, both of Tokyo, all of Japan, assignors to Showa Highpolymer Co., Ltd., Japan

PCT No. PCT/JP80/00274, § 371 Date Mar. 25, 1981, § 102(e) Date Mar. 25, 1981, PCT Pub. No. WO81/01292, PCT Pub. Date May 14, 1981

PCT Filed Nov. 5, 1980, Ser. No. 247,564

Claims priority, application Japan, Nov. 5, 1979, 54-142957

Int. Cl.³ C08L *63/10, 67/06, 75/04*

U.S. Cl. 525—28 **2 Claims**

1. A curable resin composition which comprises:

(a) an unsaturated acrylic urethane prepared by the addition reaction of a hydroxyl-terminated polymer, a polyisocyanate and a monohydroxylalkyl monoacrylate or a monohydroxylalkyl monomethacrylate, substantially free from isocyanate groups and having a weight-average extension of molecular chain of 100 Å or more and

(b) at least one member selected from the group consisting of an unsaturated polyester resin and an epoxy acrylate resin, said unsaturated acrylic urethane being present in an amount effective to increase the toughness of component (b).

4,390,663

SEMI-CONTINUOUS PROCESS FOR MAKING STAR-BLOCK COPOLYMERS

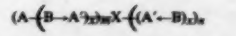
Harold L. Nicholson, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 235,244, Feb. 17, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 351,840

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—53 **6 Claims**

3. A thermoplastic star-block copolymer having a general formula



wherein the A represents a non-elastomeric polymer segment based on the monovinyl aromatic compound, the $(B\rightarrow A')_x$ or $(A'\leftarrow B)_x$ represents an elastomeric polymer segment which is a series of x tapered blocks of conjugated diene (B) to monovinyl aromatic compound (A') copolymers, m and n are integers whose sum is from 3 to 20, x is an integer from 3 to 10 representing the number of additions of conjugated diene used in the semi-continuous process and X is the radical of a polyfunctional coupling agent by means of which the linear polymer blocks are chemically linked to form the star-block copolymers.

4,390,664

PROCESS FOR PREPARING A POLYEPOXIDE AND COMPOSITION THEREFROM

Kaoru Kanayama, Ami, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

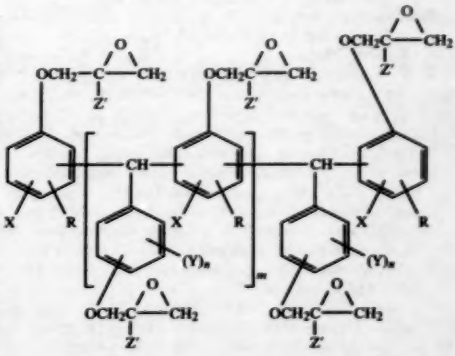
Filed Dec. 30, 1981, Ser. No. 335,813

Claims priority, application Japan, Feb. 27, 1981, 56-26770

Int. Cl.³ C08G *59/32*

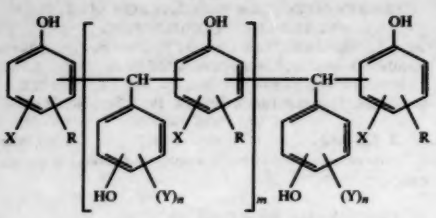
U.S. Cl. 525—117 **11 Claims**

1. A process for preparing a polyepoxide of the formula:

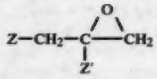


wherein R is H or an alkyl of up to about 18 carbon atoms, X is H or halogen, Y is an alkyl of up to about 18 carbon atoms or methoxy, Z' is H or CH_3, m is an integer of not less than 1; n is 0, 1 or 2, which comprises:

reacting a polyhydric phenol of the formula:



wherein R, X, Y, m and n are the same as defined above and an epihalohydrin or methylepihalohydrin of the formula:



wherein Z represents halogen and Z' represents H or CH_3.

4,390,665

POLYETHERIMIDE-EPDM TERPOLYMER BLENDS

Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 18, 1982, Ser. No. 359,258
Int. Cl.[3] C08L 79/08
U.S. Cl. 525—180 8 Claims

1. A composition comprising a blend of (a) a minor proportion of an EPDM terpolymer and (b) a polyetherimide.

4,390,666

POLYETHYLENE BLEND COMPOSITION

Kisoo Moriguchi, and Naoji Yoshii, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1982, Ser. No. 403,683
Claims priority, application Japan, Aug. 14, 1981, 56-126587
Int. Cl.[3] C08L 23/06, 23/26
U.S. Cl. 525—194 7 Claims

1. A crosslinked polyethylene composition obtained by lightly crosslinking and intimately melt blending a composition comprising high- and medium-density polyethylene (A) having a high molecular weight and a high- and medium-density polyethylene (B) having a low molecular weight, wherein

(i) the viscosity-average molecular weight of polyethylene (A) is 100,000 through 1,000,000, the viscosity-average molecular weight of polyethylene (B) is 1,000 through 100,000, and the ratio of the molecular weight of polyethylene (A) to that of polyethylene (B) is 2 through 100,

(ii) the blending ratio of polyethylene (A) to polyethylene (B) is 5:95 through 80:20, and

(iii) melt index $(MI)_1$ is 0.01 through 3.5, the ratio of the expansion factor α_2 to α_1 (α_2/α_1) is 1.1 through 10, and the ratio of the melt index $(MI)_2$ to $(MI)_1$ $[(MI)_2/(MI)_1]$ is 0.03 through 0.9, wherein:

$(MI)_1$ and $(MI)_2$ are melt indexes of the polyethylene compositions before and after crosslinking, respectively; and

α_1 and α_2 are expansion factors of the polyethylene compositions before and after crosslinking, respectively.

4,390,667

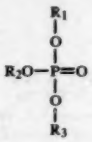
PROCESS FOR INCREASING THE MELT VISCOSITY OF POLYAMIDE WITH ARYL PHOSPHATE COMPOUND

Shaul M. Aharoni, Morris Plains, and Theodore Largman, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

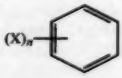
Filed Jul. 6, 1981, Ser. No. 280,564
Int. Cl.[3] C08G 9/48, 9/46
U.S. Cl. 525—420 13 Claims

1. A process for decreasing the melt index and increasing the viscosity of a polyamide which comprises:

A. forming a molten mixture of said polyamide and an effective amount of an aryl phosphate compound of the formula:



(a) wherein R_1 is a substituted phenyl group of the formula:



wherein:

X is the same or different at each occurrence and is such that the Hammett sigma (σ) values of X substituents is greater than zero; and

n is an integer which is equal to or greater than 1; and

(b) R_2 and R_3 are the same or different and are individually hydrogen or R_1; and

B. Heating said mixture for a time and at a temperature sufficient to decrease the melt index and increase the viscosity of said polyamide.

4,390,668

AUTOCLAVABLE THERMOPLASTIC MATERIAL WHICH IS HEAT BONDABLE TO A CANNULA AND THE LIKE

Edward B. Garver, Sr., Lindenhurst, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,738
Int. Cl.[3] C08L 67/02
U.S. Cl. 525—444 7 Claims

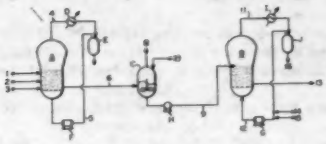
1. A thermoplastic composition consisting essentially of a combination of first and second polymers, said first polymer present in an amount of from about 50% to about 70% by combined weight of said first and second polymers and said first polymer being an autoclavable thermoplastic having a determinable heat bonding characteristic to a metallic member copolyetherester material and said second polymer present in an amount of from about 30% to about 50% by combined by weight of said first and second polymers and said second polymer being a nonautoclavable amorphous thermoplastic copolyester material based on polyethylene terephthalate and having a determinable heat bonding characteristic to the metallic member which exceeds said heat bonding characteristic of said antoclavable material said composition being autoclavable and thermally bondable to metal.

4,390,669

PROCESS FOR MULTI-STEP GAS-PHASE POLYMERIZATION OF OLEFINS

Yoshinori Morita; Shinzi Hayata, both of Iwakuni; Akifumi Kato, Ohtake; Hideo Nara, Ohtake, and Tohru Watanabe, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,593
Claims priority, application Japan, May 27, 1980, 55/69557
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.³ C08F 2/34, 10/00
U.S. Cl. 526—65 10 Claims



1. In a process for polymerizing olefins in the gaseous phase in a first gas-phase polymerization zone and a second gas-phase polymerization zone, which are provided independently from each other, in the presence of a catalyst composed of a transition metal catalyst component and an organometallic compound of a metal of Groups I to III of the periodic table while feeding the catalyst-containing polymer formed in the first zone to the second zone; the improvement comprising

(i) forming a suspension of the polymer from the first zone by feeding an easily volatile hydrocarbon medium, which is liquid under the conditions of feeding the polymer, to a suspension zone in the feed passage for feeding the polymer from the first zone to the second zone, and

(ii) feeding the suspension of the polymer in said liquid medium formed in the suspension zone to the second zone.

4,390,670

ACRYLATE/MALEATE COPOLYMERS, THEIR PREPARATION AND USE AS ANTISCALANTS

Stanley W. Walinsky, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,475
Int. Cl.³ C08F 2/06
U.S. Cl. 526—79 5 Claims

1. A process for preparing a substantially homogeneous acrylate-maleate copolymer of number average molecular weight from about 500 to 5000, which comprises:

copolymerizing from about 35 to 65 mole percent acrylic or methacrylic acid monomer with from about 65 to 35 mole percent maleic anhydride monomer over a period of from about 0.3 to 10 hours at a temperature of from about 80° to 150° C. in the presence of from about 5 to 25 weight percent polymerization initiator, based on the total weight of said monomers, and from about 45 to 90 weight percent of chain-transfer solvent, based on the total weight of said monomers, initiator and solvent,

said maleic anhydride monomer, said initiator and up to about 10 percent of said acrylic or methacrylic acid monomer being dissolved in said solvent and the remainder of said acrylic or methacrylic acid monomer being introduced over said period at a rate such that said monomer and said copolymer remain in solution in said solvent,

said solvent being selected from the group consisting of ketones, esters and ethers having from 4 to 10 carbon atoms, and mixtures thereof.

4,390,671

CATALYST COMPONENT FOR USE IN THE POLYMERIZATION OF α-OLEFINS AND A METHOD OF USING THE SAME

Masafumi Imai, Ooi; Hiroshi Ueno, Namekawa; Naomi Inaba, Ooi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 59,791, Jul. 23, 1979, Pat. No. 4,253,984.
This application Sep. 26, 1980, Ser. No. 191,657
Claims priority, application Japan, Jul. 28, 1978, 53/91536
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—125 6 Claims

1. A process for the polymerization of α-olefins, which comprises subjecting α-olefins to homopolymerization or to copolymerization with ethylene or other α-olefins in the presence of a catalyst comprising:

(a) a titanium-containing solid catalyst component which is produced by a process comprising:

adding from 0.05 to 5 moles per gram atom titanium of tributylaluminum or said aluminum compound complexed with ethyl benzoate to a supported titanium (IV) halide on magnesium halide;

subjecting the mixture to mechanical grinding treatment in the presence of ethylene or propylene to yield a titanium-containing solid catalyst component prepolymerized with from about 0.5 to 100% by weight of polymer;

subjecting the prepolymerized titanium-containing solid catalyst component to a further grinding treatment in vacuum, an inert gas or an inert solvent; and

recovering the resulting titanium-containing solid catalyst component; and

(b) an organo aluminum catalyst component prepared by subjecting an organo aluminum compound and an electron donative compound to a mixing treatment.

4,390,672

MALEIC ACID ANHYDRIDE COPOLYMERS AND THEIR PREPARATION

Wulf von Bonin, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,473
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042471
Int. Cl.³ C08F 2/38
U.S. Cl. 526—209 4 Claims

1. A process for the preparation of maleic acid anhydride copolymers with (meth)acrylic acid by radical polymerization in the solvent-free maleic acid anhydride melt in the presence from 0.01 to 2% by weight of initiators at temperatures from 60° to 200° C. comprising polymerizing in the presence of from 0.3 to 1.5% by weight of enol ethers of tetrahydrobenzaldehydes as regulators.

4,390,673

PROCESS FOR PRODUCING SUBSTANTIALLY GEL-FREE BUTADIENE-ISOBUTYLENE COPOLYMERS UTILIZING A BF_3/ROH CATALYST SYSTEM

Kang I. Lee, Framingham, Mass., and James Oziomek, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 11, 1981, Ser. No. 301,482
Int. Cl.³ C08F 4/14
U.S. Cl. 526—212 14 Claims

1. A process for preparing substantially gel-free copolymers of butadiene and isobutylene, having a number average molecular weight of from about 50,000 to about 200,000 and a degree of unsaturation of from about 3 weight percent to about 25 weight percent, which comprises the steps of:

(a) preparing a reaction mixture by dissolving from 50 to 80 mole percent of 1,3-butadiene and from 50 to 20 mole percent of isobutylene monomers in an aliphatic hydrocarbon solvent or a mixture of aliphatic hydrocarbon solvents; and

(b) polymerizing the monomers in the reaction mixture at a temperature of below −95° C. in the presence of a catalyst system consisting of a BF_3 catalyst and an ROH cocatalyst, wherein R is an organic radical selected from the group consisting of alkyl, cycloalkyl, substituted alkyl, aryl and substituted aryl groups, said alkyl groups containing from 1 to 20 carbon atoms; and wherein the molar ratio of BF_3 to ROH is from about 1:1 to about 22:1.

4,390,674

UNIAXIALLY DRAWN VINYLIDENE FLUORIDE POLYMERS

Ian M. Ward, Bramhope, and John C. McGrath, Surbiton, both of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB80/00207, § 371 Date Jul. 21, 1981, § 102(e) Date Jul. 21, 1981, PCT Pub. No. WO81/01567, PCT Pub. Date Jun. 11, 1981

PCT Filed Dec. 1, 1980, Ser. No. 285,121

Claims priority, application United Kingdom, Nov. 30, 1979, 7941419

Int. Cl.³ B32B *27/16*; B29C *17/02*; H01L *41/16*

U.S. Cl. 526—255 **10 Claims**

1. A process for the preparation of a piezoelectric, pyroelectric polyvinylidene fluoride polymer material having a Young's modulus of from 3 to 15 GPa comprising uniaxially drawing in one direction only a sheet of polyvinylidene fluoride at a temperature of from 110° C. to 170° C. to a draw ratio of at least 6 to 1 and poling the drawn sheet by applying an electric field across its thickness to effect its polarization.

4,390,675

CURABLE COMPOSITION AND USE THEREOF

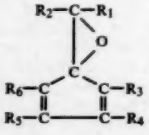
Bruce A. Gruber, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 10, 1981, Ser. No. 300,788

Int. Cl.³ C08F *24/00*

U.S. Cl. 526—273 **12 Claims**

1. A composition containing an epoxidized fulvene of the formula:



wherein each R_1 and R_2 individually is hydrogen or a hydrocarbon containing 1 to 10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain; or a furyl group; or are interconnected to form a cyclic group, each R_3 and R_6 individually is hydrogen or methyl; each R_4 and R_5 individually is hydrogen or methyl or

provided that a maximum of only one such R_3, R_4, R_5, and R_6 is methyl; and provided that a maximum of any one such R_4 and R_5 is

or prepolymer thereof or mixtures thereof, wherein said prepolymer contains at least about 8% oxirane and a catalytic amount of an acid catalyst having a pKa of about 4 or less.

4,390,676

ULTRAVIOLET ABSORBING LENSES

Samuel Loshaek, Chicago, Ill., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 741,695, Nov. 15, 1976, Pat. No. 4,304,895, which is a division of Ser. No. 371,603, Jun. 20, 1973, abandoned. This application Jun. 29, 1981, Ser. No. 278,310

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ C02C *7/04*; C08F *12/24, 16/12, 216/12*

U.S. Cl. 526—313 **8 Claims**

1. A lens for use by aphakics in contact with the eye comprising a shaped body comprising a polymer formed by copolymerizing a monomer suitable for use in making such lenses and a copolymerizable monomeric ultraviolet absorber, said absorber being in a steady state with respect to extraction thereof from said body by an aqueous medium and being present in an amount sufficient to absorb radiation in the wavelength range of about 340 to 450 mmu.

4,390,677

ARTICLE MOLDED FROM ETHYLENE HYDROCARBON COPOLYMER

Frederick J. Karol; George L. Goeke, both of Belle Mead; Burkhard E. Wagner, Highland Park; William A. Fraser, Princeton, all of N.J.; Robert J. Jorgensen, Dunbar, W. Va., and Nils Friis, Macungie, Pa.

Continuation-in-part of Ser. No. 892,323, Mar. 31, 1978, abandoned. This application Feb. 27, 1979, Ser. No. 14,413

Int. Cl.³ C08F *210/06, 210/08*

U.S. Cl. 526—348.6 **11 Claims**

1. A flexible injection molded article comprising low pressure copolymer of ethylene and at least one monomer selected from the group consisting of propylene and butene-1 having a density of ≧0.91 to ≦0.94; a melt index of ≧2 to ≦80; a M_w/M_n in the range of from about 2.7 to about 4.1; a secant modulus of ≧30,000 to ≦80,000 psi; and a stress crack resistance of greater than 21 days.

4,390,678

ONE-PACKAGE HEAT CURABLE AROMATIC POLYURETHANE COMPOSITION USEFUL FOR JOINING SUBSTRATES AND AS AN IN-MOLD COATING COMPRISING AN ISOCYANATE TERMINATED PREPOLYMER AND A POLYHYDROXY COMPOUND

Stanley B. LaBelle, Anoka, and James A. E. Hagquist, St. Paul, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed Jan. 7, 1982, Ser. No. 337,623

Int. Cl.³ C08G *18/10*

U.S. Cl. 528—60 **29 Claims**

1. A one-package aromatic heat curable polyurethane composition which comprises:

(a) a substantially liquid aromatic isocyanate terminated prepolymer phase comprising the reaction product of an aromatic polyisocyanate compound, and a polyhydroxy compound; and

(b) a separate solid polyhydroxy compound phase, comprising a solid polyhydroxy compound having two or more

hydroxyl groups that is insoluble in and dispersed throughout the substantially liquid isocyanate terminated prepolymer phase;

wherein the ratio of OH groups in the solid insoluble polyhydroxy compound phase to the NCO groups in the substantially liquid isocyanate terminated prepolymer phase is less than 2:1.

4,390,679

LATENT URETHANE RESIN SYSTEMS

Jonas Weiss, Port Chester, and Raymond Seltzer, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,858
Int. Cl.³ C08G 18/32
U.S. Cl. 528—64 **13 Claims**

1. A curable polyurethane resin composition comprising a polyisocyanate and as a curing agent therefor the product resulting from the reaction of an aliphatic, cycloaliphatic or aromatic anhydride or imide with an unsubstituted or lower alkyl-substituted aromatic, araliphatic or cycloaliphatic polyamine.

4,390,680

PHENOLIC HYDROXYL-CONTAINING COMPOSITIONS AND EPOXY RESINS PREPARED THEREFROM

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1982, Ser. No. 362,801
Int. Cl.³ C08G 59/00, 65/08, 65/14
U.S. Cl. 528—97 **21 Claims**

1. An epoxy resin composition resulting from the dehydrohalogenation of the reaction product of

(A) an epoxy alkyl halide; with

(B) an acid catalyzed product resulting from reacting

(1) at least one aromatic hydroxyl-containing compound having from one to two aromatic rings and at least one ortho or para position with respect to a hydroxyl group available for ring alkylation; with

(2) at least one unsaturated hydrocarbon selected from

(a) monounsaturated or diunsaturated hydrocarbons having from 4 to 6 carbon atoms or mixture thereof;

(b) unsaturated hydrocarbons containing an average of from 6 to about 55 carbon atoms per molecule and containing not more than 94 weight percent dicyclopentadiene;

(c) oligomers and/or cooligomers of hydrocarbon dienes, which dienes have from 4 to about 18 carbon atoms and which dienes contain at least 6% by weight of dienes other than dicyclopentadiene; and

(d) mixtures thereof; and

wherein the components (B-1) and (B-2) are employed in quantities which provide a mole ratio of (B-1) to (B-2) of from about 1.5:1 to about 30:1, and components (A) and (B) are employed in quantities which provide an epoxy group to phenolic hydroxyl group ratio of from about 1.5:1 to about 20:1.

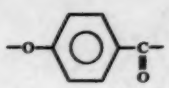
4,390,681

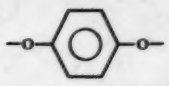
LIQUID CRYSTAL COPOLYESTERS

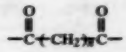
Oliver D. Deex, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 4, 1982, Ser. No. 354,569
Int. Cl.³ C08G 63/60
U.S. Cl. 528—193 **5 Claims**

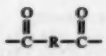
1. A copolyester capable of forming a thermotropic melt phase at a temperature below about 340° C. and having an inherent viscosity of at least about 0.3, consisting essentially of the following divalent radicals:


(A)


(B)


(C)

and


(D)

wherein n is in the range of 6 to 10; wherein R is an aromatic radical, selected from the group consisting of 1,3 phenylene, 1,4-phenylene, 1,5 naphthalene, 2,6-naphthalene, 2,7-naphthalene, wherein the range of radical A is from 10 to 60 mole percent of the copolyester and the range of radical C is from 5 to 100 mole percent of the total of radicals C and D and wherein the inherent viscosity is determined at 30° C. with a solution of copolyester in a phenol symtetrachloroethane solvent pair of weight ratio 3:2, at a concentration of 0.5 gram per 100 ml.

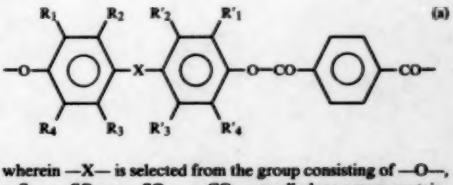
4,390,682

AROMATIC COPOLYESTER

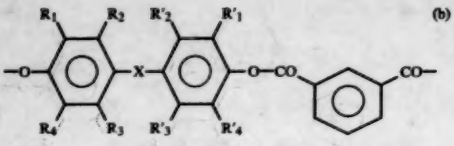
Kayomon Kyo, Kyoto; Yasuhiko Asai, Uji; Isamu Hirose, Kyoto, and Nobuo Suyama, Uji, all of Japan, assignors to Unitika Ltd., Hyogo, Japan

Continuation of Ser. No. 88,313, Oct. 25, 1979, abandoned. This application Oct. 5, 1981, Ser. No. 308,646
Claims priority, application Japan, Oct. 25, 1978, 53-132010
Int. Cl.³ C08G 63/18
U.S. Cl. 528—194 **12 Claims**

1. An aromatic polyester copolymer consisting essentially of about 10 to about 90 mol% of a recurring unit of the formula (a):


(a)

wherein —X— is selected from the group consisting of —O—, —S—, —SO_2—, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms and an alkylidene group containing 1 to 4 carbon atoms; and R_1, R_2, R_3, R_4, R'_1, R'_2, R'_3 and R'_4, which are the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 4 carbon atoms; and about 90 to about 10 mol% of a recurring unit of the formula (b):



(b)

wherein —X—, R_1, R_2, R_3, R_4, R'_1, R'_2, R'_3, and R'_4 have the definition in formula (a); and having a logarithmic viscosity number of about at least 0.3 as measured in a mixture of phenol and tetrachloroethane (6:4 in weight ratio) at a concentration of 1 g/100 cc at 25° C. and a terminal carboxyl content of 16 mol eq./ton or less.

4,390,683

STRETCHED FILM STRUCTURE OF THE POLY-1,3-PHENYLENE TEREPHTHALATE TYPE

Tadao Yatsu; Akira Todo, both of Iwakuni, and Toshiki Sotoyama, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,101

Claims priority, application Japan, Oct. 9, 1980, 55-140490; Nov. 20, 1980, 55-162618

Int. Cl.³ C08G *63/02, 63/18*

U.S. Cl. 528—194 **6 Claims**

1. A monoaxially or biaxially stretched film structure, or a heat-set structure thereof, of an unstretched film of an aromatic polyester of the poly-1,3-phenylene terephthalate type, said aromatic polyester having an intrinsic viscosity, determined in p-chlorophenol at 50° C., of 0.4 to 2.0 and being composed of (A) polybasic carboxylic acid component units consisting of terephthalic acid units (a_1) and units (a_2) of a polybasic carboxylic acid other than terephthalic acid, the proportion of the units (a_2) being up to 25 mole% based on the units (a_1) and units (a_2) combined, and (B) polyol component units consisting of resorcinol units (b_1) and units (b_2) of a polyol other than resorcinol, the proportion of the units (b_2) being up to 25 mole% based on the units (b_1) and (b_2) combined, the stretched film having a crystallinity of 15 to 55%.

4,390,684

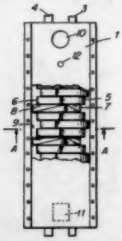
CONTINUOUS POLYMERIZATION METHOD

Hiroyasu Komazawa, Takarazuka; Tadashi Mori, Fujinomiya; Yukio Ikenaga, Fuji; Hiroshi Hotta, Fuji, and Tuneyasu Nakashima, Fuji, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Aug. 12, 1981, Ser. No. 292,073

Int. Cl.³ C08G *2/10*

U.S. Cl. 528—230 **3 Claims**



1. A method of continuous polymerization of a liquid polymerization medium to obtain fine particles of polymer product by conducting the reaction in a polymerization reactor wherein mixing is effected by the action of a plurality of elliptical paddles mounted on each of dual rotating shafts, characterised in that the shafts are rotated in reverse directions to each other, and the paddles are enclosed by walls of the reactor with the inside surface of major axes of the elliptical paddles on one rotating shaft periodically approaching the ends of the minor axes of the corresponding elliptical paddles on the other rotating shaft to effect a mixing action as well as a longitudinal shearing action across a notional interface between said two shafts.

2. A method according to claim 1 for the continuous polymerization of trioxane.

4,390,685

POLYESTER FIBER AND PROCESS FOR PRODUCING SAME

Ken-ichiro Oka; Masatoshi Mineo, both of Mishima, and Terumichi Ono, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,058

Claims priority, application Japan, Jun. 27, 1980, 55-86575; Jun. 27, 1980, 55-86576

Int. Cl.³ C08G *63/02*

U.S. Cl. 528—272 **4 Claims**

1. A polyester fiber having a residual elongation of not higher than 60%, a Young's modulus of 60 to 100 g/d, a boiling water shrinkage of 4 to 10% and a dry heat shrinkage of 5 to 12%, the peak stress temperature in a dry heat shrinkage stress curve of said fiber being lower than 100° C.

4,390,686

POLYESTER-AMIDE RESIN

Harald Janssen, Stemwarde-Siedlung, and Ferdinand Hansch, Wedel, both of Fed. Rep. of Germany, assignors to Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 109,944, Jan. 7, 1980, Pat. No. 4,360,543, which is a continuation of Ser. No. 539,879, Jan. 9, 1975, abandoned. This application Apr. 12, 1982, Ser. No. 367,537

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1974, 2401027

Int. Cl.³ C08G *69/44, 73/16*

U.S. Cl. 528—289 **16 Claims**

1. A polyester amide resin produced by condensing a polybasic acid with polyhydric alcohol, one of which contains one or more five-membered imide rings between functional groups of the molecule which resin is the product of condensing said polybasic acid and said polyhydric alcohol in the presence of an excess of one or more shortchain diols followed by removal of the diol or diols in such a manner that the condensation is only effected to an extent such that the Durrans softening point of the unhardened resin is not greater than 150° C. and the viscosity of the molten resin at 180° C. is not greater than 5000 mPa s (cP).

4,390,687

HIGH MELT STRENGTH ELASTOMETRIC COPOLYESTERS

William C. T. Tung, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 21, 1981, Ser. No. 304,275

The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.

Int. Cl.³ C08G *63/66, 63/18*

U.S. Cl. 528—295 **11 Claims**

1. A high melt strength, elastomeric, copolyester, comprising:

the polymeric reaction product of

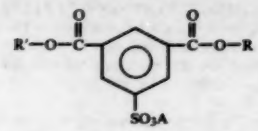
(a) terephthalic acid or a 1 to 4 carbon atom dialkyl ester thereof;

(b) a dimer acid;

(c) a poly(tetramethylene oxide) glycol having a molecular weight of from about 600 to about 2,000;

(d) 1,4-butane diol; and

(e) an ionic compound having the formula



where A is an alkali radical and where R and R' are alkyls having from 1 to 4 carbon atoms;

the amount of said terephthalic acid or said dialkyl ester thereof ranging from about 80.0 mole percent to about 99.9 mole percent, and the amount of said dimer acid ranging from about 0.1 mole percent to about 15.0 mole percent, said percentages being based upon the total number of moles of said acid constituents or reactive equivalents thereof,

the amount of said poly(tetramethylene oxide) glycol ranging from about 2.0 to about 12.0 mole percent andd the amount of said 1,4-butane diol ranging from about 88.0 mole percent to about 98.0 mole percent, and from about 0.1 to about 5.0 mole percent of said ionic compound, the total mole percent of said acid, said dimer acid, and said ionic compound being about 100 mole percent,

additionally including a molar excess of said 1,4-butane diol ranging from about 5.0 to about 120 percent, said mole percentages of said excess 1,4-butane diol being based upon the total number of moles of said glycol and said 88.0 to said 98.0 mole percent of said 1,4-butane diol so that the molar ratio of all of said glycol constituents to all of said acid constituents or their reactive equivalents and said ionic compound ranges from about 1.05 to about 2.2.

4,390,688

WATER-DILUTABLE POLYESTER, PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF

Gerd Walz, Wiesbaden; Thaddäus Wirth, Heidenrod-Wisper, and Walter Sprenger, Dieburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,571

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109968; Aug. 22, 1981, 3133319

Int. Cl.[3] **C08G** *63/54;* **C08L** *63/00*

U.S. Cl. 528—295.3 **11 Claims**

1. A water-dilutable polyester having a good resistance to hydrolysis in which free COOH-groups are at least partially present in the form of ammonium salts, derived from

(A) at least one dicarboxylic acid unit;

(B) at least one polycarboxylic monoanhydride being built-in in the form of a half-ester and different from phthalic anhydride and maleic anhydride;

(C) at least one alcohol component containing an at least dihydric alcohol and

(D) at least one epoxy compound having at least two oxiran rings and being selected from the group consisting of epoxidized fatty acids, derivatives thereof, epoxidizid aliphatic hydrocarbons and mixtures thereof with monoepoxides.

3. A process for the preparation of a polyester as claimed in claim 1 which comprises

(a) reacting in a first step (A) at least one dicarboxylic acid unit with (D) at least one epoxy compound having at least two oxiran rings, selected from the group consisting of epoxidized fatty acids, derivatives thereof, epoxidized aliphatic hydrocarbons and mixtures thereof with monoepoxides and (C) at least one alcohol component comprising an at least dihydric alcohol to form a polyester having an acid number between 2 and 100,

(b) reacting in a second step any polyester obtained in step (a) having an acid number of at least 15 with an epoxy compound selected from the group consisting of a monoepoxide, a polyepoxide and a combination of both, said epoxide containing additionally at least one ester group, to form a polyester having an acid number below 15,

(c) reacting the polyester having an acid number below 15 obtained in step (a) or (b) with (B) at least one polycarboxylic monoanhydride, different from phthalic anhydride and maleic anhydride, between ambient temperature and 170° C., thus forming a half-ester of the monoanhydride.

(d) converting free COOH—groups of the half-ester obtained in step (c) with an amine to the ammonium salt and

(e) separating the product of step (d) or diluting said product with a suitable solvent.

4,390,689

POLYCATIONIC POLYMERS AND THEIR PREPARATION

Bernard Jacquet, Antony; Gerard Lang, Epinay sur Seine; Alain Malaval, Aulnay sous Bois; Serge Forestier, Claye Souilly, and Do Le Trung, Drancy, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

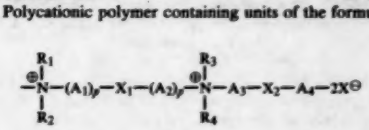
Filed Dec. 17, 1980, Ser. No. 217,403

Claims priority, application France, Dec. 21, 1979, 79 31432

Int. Cl.[3] **C08G** *69/26*

U.S. Cl. 528—335 **27 Claims**

1. Polycationic polymer containing units of the formula

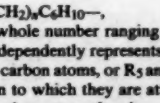


wherein R_1, R_2, R_3 and R_4, each independently represents a hydrocarbon group containing up to 20 carbon atoms, or at least one pair selected from the group consisting of R_1, R_2 and R_3,R_4, together with the nitrogen atom to which it is attached, forms a heterocycle selected from the group consisting of a heterocycle wherein the heteroatom is nitrogen or a heterocycle containing a nitrogen as a first heteroatom and a second heteroatom selected from the group consisting of oxygen and sulfur;

A_1, A_2, A_3 and A_4, each independently represents alkylene or arylene containing up to 20 carbon atoms;

p is 0 or 1;

when p is 0, X_1 represents $—C_6H_4—CO—C_6H_4—$, $—C_6H_4—CHOH—C_6H_4—$,



or $—C_6H_{10}—(CH_2)_n—C_6H_{10}—$,

wherein n is a whole number ranging from 1 to 6,

R_5 and R_6 each independently represents hydrogen or alkyl, having up to 20 carbon atoms, or R_5 and R_6, together with the carbon atom to which they are attached, form a ring having 5 or 6 carbon atoms therein;

when p is 1, X_1 represents

$—N(R_7)—(CO—X_3)_y—CO—N(R_8)—$, $—CO—O—$, $—CO—NH—$, $—O—CO—NH—$, $—CO—X_4—CO—$, $—O—CO—X_5—CO—O—$, $—O—$, $—S—$, $—SO—$, $—SO_2—$, $—S—S—$ or $—N(R_9)—$,

wherein X_3 represents alkylene, alkylene interrupted by an $—S—S—$ group, alkenylene, arylene, diaminoalkylene, diaminoarylene, dioxyalkylene, polyoxyalkylene, or dioxyarylene, or X_3 represents a direct covalent bond,

X_4 represents diaminoalkylene, dioxyalkylene, diaminoarylene, dioxyarylene, polyoxyalkylene or dithioalkylene,

X_5 represents alkylene, arylene, diaminoalkylene, diaminocycloalkylene or diaminoarylene,

y is 0 or 1,

R_7, R_8 and R_9 each independently represents hydrogen or alkyl containing up to 12 carbon atoms;

X_2 represents $-N(R_{10})-(CO-X_3)_z-CO-N(R_{11})-$, $-CO-O-$, $-CO-NH-$, $-O-CO-NH-$, $-CO-X_4-CO-$ or $-O-CO-X_5-CO-O-$, wherein X_3, X_4 and X_5 are defined above, z is 0 or 1 and R_{10} and R_{11} each independently represents hydrogen or alkyl containing up to 12 carbon atoms;

with the proviso that when p is 1 and X_1 represents a heteroatom selected from the group consisting of oxygen and sulfur, z is other than 0.

4,390,690

LAYERED ORGANOPHOSPHOROUS INORGANIC POLYMERS CONTAINING OXYGEN BONDED TO CARBON

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corp., Irvine, Calif.

Continuation of Ser. No. 60,249, Jul. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 945,971, Sep. 26, 1978, Pat. No. 4,232,146. This application Jun. 12, 1981, Ser. No. 273,027
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.³ C08G 79/04, 79/00
U.S. Cl. 528—395 27 Claims

1. A process for the production of phosphorus containing organo substituted inorganic polymers containing oxygen bonded to carbon which comprises reacting in a liquid medium:

(a) at least one organophosphorus acid of the formula

$[(HO)_2OP]_nR$ or $[(HO)_2OPO]_nR$

wherein n is 1 or 2 and R is an organo group covalently coupled to phosphorus and which also contains oxygen coupled to carbon but not to phosphorus and wherein when n is 2, R contains at least two carbon atoms and is directly or indirectly coupled to the phosphorus atoms through different carbon atoms whereby the two phosphorus atoms are separated by at least two carbon atoms, (b) with at least one tetravalent metal ion, to precipitate from the liquid medium, a solid inorganic polymer in which the molar ratio of phosphorus to tetravalent metal is about 2 to 1 and in which the organo group is covalently bonded to phosphorus and phosphorus is linked to the tetravalent metal through oxygen.

4,390,691

PROCESS FOR PREPARING POROUS SPHERICAL CELLULOSE PARTICLES

Masahiko Nishikawa; Hiroaki Ishibashi, and Hidenori Furukawa, all of Minamatashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jul. 21, 1981, Ser. No. 285,582
Claims priority, application Japan, Aug. 21, 1980, 55-114982
Int. Cl.³ C08B 3/06, 3/08, 3/16, 3/18
U.S. Cl. 536—65 15 Claims

1. A process for preparing porous, spherical cellulose particles with high reproducibility, comprising the steps of dissolving a cellulose organic ester in a solvent consisting essentially of a chlorinated hydrocarbon, adding 0.001–20 wt.% (based on said cellulose organic ester) of an acid or alkali to the dissolved cellulose organic ester solution, mixing the resultant solution at a temperature from 0° to 45° C. for a period of time of from 0.2 to 30 hours, suspending said cellulose organic ester solution in an aqueous medium to thereby form droplets, removing said solvent by evaporation to form cellulose organic ester particles, and saponifying said cellulose particles.

4,390,692

TRIMETHYLSILYLATION OF CELLULOSE

John G. Green, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1982, Ser. No. 390,455
Int. Cl.³ C08B 11/00
U.S. Cl. 536—84 11 Claims

1. A method for the preparation of trimethylsilyl cellulose ethers, which comprises reacting cellulose with hexamethyldisilazane in the presence of a small amount of catalyst, wherein the catalyst is acetamide, acetamide and an ammonium halide, N,N-dimethylformamide and an ammonium halide, N,N-dimethylformamide and trimethylsilyl chloride, 2-oxazolidinone and an ammonium halide, or a mixture thereof.

4,390,693

CEPHALOSPORIN COMPOUNDS

Thomas R. Beattie, North Plainfield; John Hannah, Matawan, and David B. R. Johnston, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 819,511, Jul. 27, 1977, Pat. No. 4,255,423, which is a continuation of Ser. No. 624,623, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 367,291, Jun. 4, 1973, abandoned. This application Oct. 9, 1980, Ser. No. 195,690
Int. Cl.³ C07D 501/57; A61K 31/545
U.S. Cl. 542—442 4 Claims

1. The compound 3-(4-thiazoylvinyl)-7α-methoxy-7β-(2-thienylacetamido)-3-cephem-4-carboxylic acid.

4,390,694

METHOD FOR PREPARING STABLE CRYSTALS OF SALT OF CEFTIZOXIME

Norio Ohnishi, Kyoto, and Rinta Ibuki, Ashiya, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1981, Ser. No. 283,805
Claims priority, application Japan, Jul. 22, 1980, 55-100680
Int. Cl.³ A61K 31/545; C07D 501/04
U.S. Cl. 544—22 8 Claims

1. A method for preparing stable crystals of an alkali metal salt of ceftizoxime, which comprises adding an aqueous solution of the salt of ceftizomime to isopropyl alcohol, and collecting the precipitating crystals.

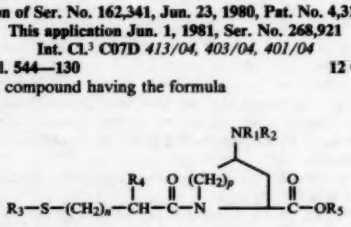
4,390,695

IMIDO, AMIDO AND AMINO DERIVATIVES OF MERCAPTOACYL PROLINES AND PIPECOLIC ACIDS

John Krapcho, Somerset, and Peter C. Wade, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 162,341, Jun. 23, 1980, Pat. No. 4,310,461. This application Jun. 1, 1981, Ser. No. 268,921
Int. Cl.³ C07D 413/04, 403/04, 401/04
U.S. Cl. 544—130 12 Claims

1. A compound having the formula



wherein

R_1 and R_2 together with the nitrogen atom to which they are attached are 1-pyrrolidinyl, 1-piperidinyl, 1-homopiperidinyl, 4-morpholinyl, 4-alkyl-1piperazinyl, or 4-aryl-1-piperazinyl;

R_3 is hydrogen, alkyl, aryl, arylalkyl, alkanoyl or arylcarbonyl;

R_4 is hydrogen, alkyl, alkylthio, or trifluoromethyl;

R_5 is hydrogen, alkyl, or arylalkyl;

n is 0, 1 or 2; and

p is 1 or 2;
or a non-toxic, physiologically acceptable salt thereof, or symmetrical dimer thereof; wherein the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl, or phenyl monosubstituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, phenyl or trifluoromethyl groups; the term "alkanoyl" refers to groups having up to 9 carbon atoms; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

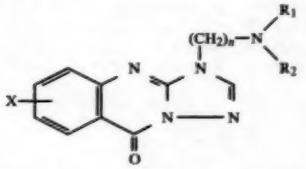
4,390,696
Patent Not Issued For This Number

4,390,697
PROCESS FOR THE PREPARATION OF TRIAZOLOQUINAZOLINONES

Wilfred R. Tully, Cirencester Glous, England, assignor to Rousel Uclaf, Paris, France

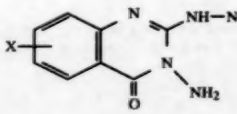
Filed Nov. 3, 1981, Ser. No. 317,858
Claims priority, application United Kingdom, Nov. 10, 1980, 8036025
Int. Cl.³ C07D *487/04*
U.S. Cl. 544—251 **9 Claims**

1. A process for the preparation of triazoloquinazolinones of the formula



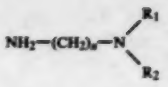
I

wherein X is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, $-NO_2$, $-CF_3$, $-CH_3$ and $-OCH_3$, n is an integer from 2 to 5, R_1 and R_2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and hydroxyalkyl of 1 to 5 carbon atoms or taken together with the nitrogen atom which they are attached form a saturated heterocycle optionally containing another heteroatom and optionally substituted with at least one member of the group consisting of hydroxy, alkyl and hydroxy alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, acyl of an aliphatic carboxylic acid of 1 to 5 carbon atoms, alkoxycarbonyl of 2 to 6 carbon atoms, phenyl and phenyl substituted with halogen or $-CF_3$ comprising reacting a compound of the formula



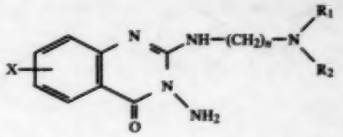
II

wherein X has the above definition with a compound of the formula



III

wherein R_1, R_2 and n have the above definition to obtain a compound of the formula



IV

reacting the latter with a formylation agent to obtain the corresponding compound of formula I and optionally reacting the latter with a non-toxic, pharmaceutically acceptable acid to obtain the corresponding acid addition salt of the compound of formula I.

4,390,698
DETHEOBROMINATION OF COCOA

Jacky Chiovini, Daillens; Maurice Blanc, Morges, and Geoffrey Margolis, Bussigny, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 21, 1981, Ser. No. 266,091
Int. Cl.³ C07D *473/10*
U.S. Cl. 544—274 **10 Claims**

1. A process for recovering theobromine from an aqueous solution containing theobromine extracted from cocoa material comprising:

(a) contacting the solution with a substantially neutral adsorbent; said adsorbent having the characteristic that when immersed in water, the pH of the water remains essentially unchanged; and then

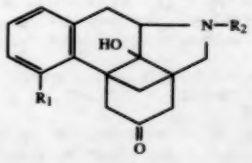
(b) separating the adsorbent laden with theobromine from the aqueous solution of reduced theobromine content.

4,390,699
6-KETO-MORPHINANS BELONGING TO THE 14-HYDROXY-SERIES

Arnold Brossi; Helmut Schmidhammer, both of Bethesda, and Arthur E. Jacobson, Potomac, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jul. 16, 1981, Ser. No. 284,089
Int. Cl.³ C07D *221/28*; A61K *31/485*
U.S. Cl. 546—74 **8 Claims**

1.



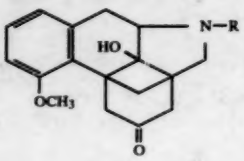
I

where

R_1=H, O lower alkyl, or O lower acyl

R_2=Lower alkyl, lower alkenyl, cyclopropylmethyl, or Ph lower alkyl.

2.



II

where

R=methyl, phenethyl, allyl, cycloalkylmethyl wherein alkyl is C_3–C_6, dimethylallyl, alkynyl, or H.

4,390,700

1-CARBOXYAZAALKANOYL-TETRAHYDROQUINOLINE-2-CARBOXYLIC ACIDS

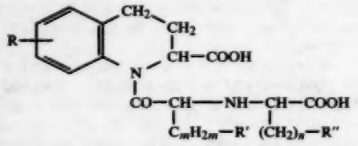
James L. Stanton, Ossining, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,804

Int. Cl.³ C07D *215/12, 215/16*

U.S. Cl. 546—165 **5 Claims**

1. A compound corresponding to the formula



wherein R is hydrogen, alkyl or alkoxy with up to 4 carbon atoms, hydroxy, halogeno or trifluoromethyl; m is an integer from 1 to 4; n is an integer from 1 to 3; R′ is hydrogen; and R″ is hydrogen or R-phenyl; the mono lower alkyl esters with a free 1,2,3,4-tetrahydroquinoline-2-carboxy group, and pharmaceutically acceptable alkali metal, ammonium or acid addition salts thereof.

4,390,701

1-AMINO-2-[3-(3-PIPERIDINOMETHYLPHENOXY)-PROPYLAMINO]CYCLOBUTENE-3,4-DIONE

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,533

Int. Cl.³ C07D *295/12*

U.S. Cl. 546—235 **2 Claims**

1. 1-Amino-2-[3-(3-piperidinomethylphenoxy)propylamino]-cyclobutene-3,4-dione, or a nontoxic pharmaceutically acceptable salt thereof

4,390,702

3-SUBSTITUTED-3-FLUOROPYRUVIC ACIDS AND THEIR ESTERS AND SALTS, AND PRODUCTION THEREOF

Susumu Misaki; Masahiro Suefuji; Tadahiko Tsushima, and Hiroshi Tanida, all of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd. and Shionogi and Co., Ltd., both of Osaka, Japan

Filed Dec. 29, 1980, Ser. No. 220,917

Claims priority, application Japan, Dec. 29, 1979, 54-173593

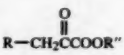
Int. Cl.³ C07D *213/55;* **C07C** *69/76, 53/21*

U.S. Cl. 546—296 **10 Claims**

1. A process for preparing a 3-substituted-3-fluoropyruvic acid or ester or salt thereof of the formula:

(I)

wherein R is a lower alkyl group, a lower alkanoyl group, a monofluorinated lower alkanoyl group, a substituted phenyl group substituted with one or two groups selected from the group consisting of lower alkyl, lower alkoxy, lower alkanoyl, hydroxyl, halogeno, nitro, amino, mono(lower)alkylamino and di(lower)alkylamino groups an unsubstituted phenyl group, a substituted pyridyl group substituted with one or two groups selected from the group consisting of lower alkyl, lower alkoxy, lower alkanoyl, hydroxyl, nitro, amino, mono(lower)alkylamino and di(lower)alkylamino groups or an unsubstituted pyridyl group and R′ is a hydrogen atom, an ester-forming residue selected from the group consisting of a lower alkyl group, a substituted phenyl group substituted with one or two groups selected from the group consisting of lower alkyl, lower alkoxy, lower alkanoyl, hydroxyl, halogeno, nitro, amino, mono(lower)alkylamino and di(lower)alkylamino groups, an unsubstituted phenyl group or a salt-forming residue selected from the group consisting of alkali metal, alkaline earth metal, ammonium and lower alkylammonium salts which comprises reacting a 3-R-pyruvic ester of the formula:



(II)

wherein R″ is said ester-forming residue and R is as defined above with a fluorinating agent selected from the group consisting of fluorine, perfluoroalkyl hypofluorite and xenon difluoride in a solvent inert under the reaction conditions to give a 3-R-3-fluoropyruvic ester of the formula:

(III)

wherein R and R″ are each as defined above, optionally followed by hydrolysis of the 3-R-3-fluoropyruvic ester (III) to give a 3-R-3-fluoropyruvic acid of the formula:

(IV)

wherein R is as defined above and further optionally followed by conversion of the 3-R-3-fluoropyruvic acid (IV) into a salt thereof of the formula:

(V)

wherein R‴ is said salt-forming residue and R is as defined above.

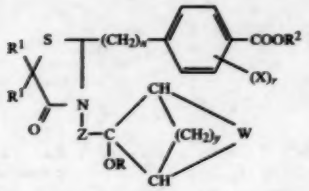
4,390,703

INTERMEDIATES FOR THE RESOLUTION OF SOME INTERPHENYLENE-9-THIA-11-OXO-12-AZAPROSTANOIC ACIDS

Mark G. Bock, Hatfield, and Robert M. Di Pardo, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 22, 1981, Ser. No. 276,117
Int. Cl.³ C07D 277/04
U.S. Cl. 548—187 3 Claims

1. A diastereomeric ester having the formula



wherein

(1) X is chlorine or methyl;
(2) r is 0, 1 or 2;
(3) n is 3 or 4;
(4) R^1 is hydrogen, deuterium or methyl;
(5) R^2 is alkyl, benzyl or diphenylmethyl;
(6) R^3 is camphanyl or camphor carbonyl;
(7) Z is ethylene, trimethylene, cis or transpropenylene or propynylene;
(8) y is 0, 1 or 2 and
(9) W is polymethylene of 2–6 carbon atoms.

4,390,704

PROCESS FOR THE PREPARATION OF 1,2,4-TRIAZOLE

Hans Beer, Vienna, Austria, assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Jul. 7, 1981, Ser. No. 281,042
Claims priority, application Austria, Jul. 7, 1980, 3533/80
Int. Cl.³ C07D 249/08
U.S. Cl. 548—262 8 Claims

1. A process for the preparation of 1,2,4-triazole by reacting hydrazine and formamide, comprising mixing formamide with hydrazine in a molar ratio of formamide to hydrazine of 2:1 to 2.2:1 in such a way that hydrazine as such or in the form of its hydrate is introduced into the formamide, which formamide has been heated to a temperature of 160°–200° C., said reaction being carried out in such a way that formamide is always present in excess, maintaining the temperature of the reaction mixture in the range of 160°–200° C. while introducing the hydrazine or hydrate, and subsequently reacting the two reactants at a temperature of 160°–240° C. without an addition of ammonia from outside into the reaction zone.

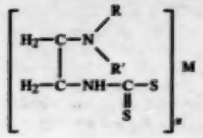
4,390,705

FUNGICIDAL N-SUBSTITUTED ETHYLENDIAMINO-DITHIOCARBAMATES WHICH DO NOT GIVE RISE TO THE FORMATION OF ETHYLENTHIOUREA

Franco Gozzo, Saronno; Nicola Troiani, Milan; Simone Lorusso, S. Giuliano Milanese, and Romano Santi, Florence, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 114,510, Jan. 23, 1980, abandoned, which is a continuation of Ser. No. 817,821, Jul. 21, 1977, abandoned. This application Jan. 29, 1982, Ser. No. 343,861
Claims priority, application Italy, Jul. 22, 1976, 25587 A/76
Int. Cl.³ C07D 333/48; C07C 143/00; A01N 55/02, 47/10
U.S. Cl. 549—3 7 Claims

1. An antifungin selected from the group consisting of ethylendiamino-dithiocarbamic acid salts in which at least one of the hydrogen atoms bound to the nitrogen atom in the amino group of ethylendiamino mono- or bis-dithiocarbamate is substituted, said antifungin having the general formula (I):



(I)

in which

R is selected from the group consisting of H and

R′ is selected from the group consisting of C_1–C_{12} alkyl, C_2–C_{12} alkenyl or alkinyl, C_2–C_{12} acyl and a sulpholanyl group;

M is selected from the group consisting of Cu, Zn and Mn; and n is 1 or 2 depending on the valence of M; and

the internal salts of the acids comprehended in formula (I), said antifungin being further characterized in that it does not form ethylenthiourea or substituted ethylenthioureas on standing or under heating.

4,390,706

PROCESS FOR THE RECOVERY OF PURE NITRILES

Axel Kleemann, Hanau, and Peter M. Schalke, Seligenstadt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,985
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006424
Int. Cl.³ C07D 333/24; C07C 121/66
U.S. Cl. 349—74 25 Claims

1. In a process for the recovery of a nitrile prepared by reacting at 500°–1200° C. cyanogen chloride with an aromatic compound or heteroaromatic compound containing a methyl group or a methylene group containing an active hydrogen and working up the reaction gas mixture, the improvement comprising condensing the reaction mixture of several successive temperature steps in which the first temperature step has the highest temperature and the last temperature step has the lowest temperature, the first condensation step having a drop in temperature to between the boiling point of the methylene or methyl compound employed and the boiling point of the nitrile, thereby condensing the nitrile as a first condensate, drawing off the condensed crude nitrile as sump product, supplying the non-condensed portion which consists chiefly of unreacted methyl or methylene compound and cyanogen chloride as well as hydrogen chloride to a second temperature step between room temperature and the boiling point of the methyl or methylene compound, thereby condensing the residual methyl or methylene compound as a second condensate and drawing off the second condensate.

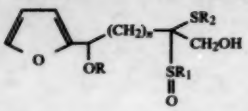
4,390,707

BIS-THIOALKYLFURANS USEFUL AS CYCLOPENTENONE PROSTAGLANDIN INTERMEDIATES

Steven L. Peake, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 2, 1982, Ser. No. 344,980
Int. Cl.³ C07D 309/06, 307/40
U.S. Cl. 549—214 10 Claims

1. A compound of the formula:



wherein R is a hydroxyl protecting group labile under neutral or acid conditions; R_1 and R_2 are both methyl or ethyl, or together are $-(CH_2)_3-$; and n is 5–7.

4,390,708

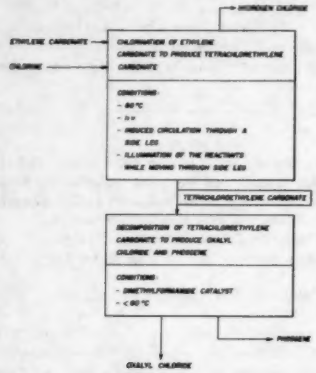
PROCESS FOR PRODUCING OXALYL CHLORIDE AND INTERMEDIATES

Robert J. Stokowski; Gerard Tertzakian, both of Edmonton, and Tomoki C. S. Ruo, Calgary, all of Canada, assignors to Terochem Laboratories Ltd., Edmonton, Canada

Filed Feb. 23, 1981, Ser. No. 236,789

Int. Cl.³ C07D *317/42*

U.S. Cl. 549—229 **10 Claims**



1. A process for producing tetrachloroethylene carbonate, comprising:

contacting ethylene carbonate with chlorine in a reaction vessel at a temperature in the range of about 70° to 100° C.;

continuously circulating the above reaction mixture from the reaction vessel through an illuminated reaction zone of reduced cross-sectional area relative to that of the reaction vessel to form tetrachloroethylene carbonate and hydrogen chloride;

adding the chlorine at the reaction zone, such that the added chlorine, together with the hydrogen chloride evolved in the reaction zone, provides the drive for circulating the reaction mixture; and

venting the hydrogen chloride from the reaction vessel.

4,390,709

PREPARATION OF GAMMA-PYRONES

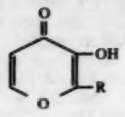
Paul D. Weeks, Gales Ferry, and Robert P. Allingham, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 741,112, Nov. 11, 1976, Pat. No. 4,342,697, which is a continuation-in-part of Ser. No. 608,452, Aug. 28, 1975, abandoned. This application Apr. 26, 1982, Ser. No. 371,932

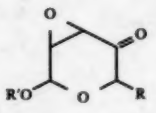
Int. Cl.³ C07D *309/38*

U.S. Cl. 549—418 **4 Claims**

1. A process for preparing a compound of the formula



wherein R is hydrogen, alkyl or 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, phenyl or benzyl which comprises contacting a compound



wherein R is as defined above and R′ is alkyl of 1 to 6 carbon atoms, at 25° to 160° C. with an acid substance selected from the group consisting of sulfuric acid, hydrochloric acid, boron trifluoride etherate, p-toluenesulfonic acid, formic acid, zinc chloride and tin tetrachloride.

4,390,710

CATALYST SYSTEM FOR MANUFACTURING P-CHLOROPHENYL-N-METHYL CARBAMATE

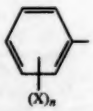
James A. Manner, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1981, Ser. No. 312,207

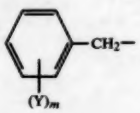
Int. Cl.³ C07D *307/77, 317/08;* C07C *125/06*

U.S. Cl. 549—441 **13 Claims**

1. In the process of preparing aromatic esters of N-substituted carbamic acids by reaction of aromatic alcohol of the general formula, R—OH, wherein R is selected from the group consisting of phenyl, naphthyl, halosubstituted naphthyl, benzofuranyl, C_1–C_4 alkyl substituted benzofuranyl, benzyl, substituted phenyl of the graphic formula:



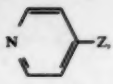
and substituted benzyl of the graphic formula:



wherein X is halogen, C_1–C_8 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthiol, C_1–C_4 dialkylamino, nitro, 1,3-dioxolanyl, 4,5-di(C_1–C_4) alkyl-1,3-dioxolanyl, and n is an integer of from 1 to 3; Y is selected from the group consisting of halogen and nitro, and m is an integer of from 1 to 2, with an isocyanate having the graphic formula:

$$R'''—N=C=O$$

wherein R‴ is selected from the group consisting of C_1–C_3 alkyl, phenyl and cyclohexyl, in the substantial absence of an extraneous solvent, the improvement which comprises conducting said reaction in the presence of a catalytic amount of a combination of (a) 4-aminopyridine catalyst having the graphic formula:



wherein Z is selected from the group consisting of

pyrrolidino, piperidino, and morpholino, and wherein R′ and R″ are each selected from the group consisting of hydrogen, C_1–C_6 alkyl and C_3–C_7 cycloalkyl, and (b) pyridine catalyst selected from the group consisting of pyridine, methylpyridines and dimethylpyridines, the weight ratio of 4-aminopyridine catalyst to pyridine catalyst being from 5:1 to 1:5.

4,390,711

16-HYDROXY-5-IODO-PROSTACYCLIN ANALOGS OF THE 1 SERIES

Charles V. Grudzinskas, Nyack, N.Y.; Sow-Mei L. Chen, Park Ridge, N.J., and Allan Wissner, Ardsley, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

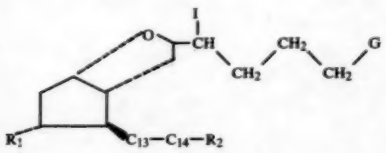
Continuation-in-part of Ser. No. 46,515, Jun. 7, 1979, Pat. No. 4,265,904. This application Nov. 13, 1980, Ser. No. 206,492

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

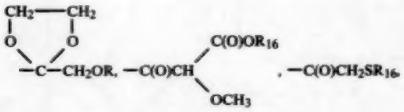
Int. Cl.[3] **C07D** *307/935*

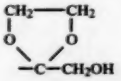
U.S. Cl. 549—465 **25 Claims**

1. A compound of the formula:



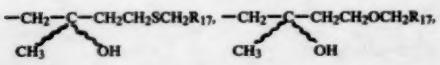
wherein G is selected from the group —C(O)OR, —CH_2OH, —C(O)CH_2OR, —C(O)CH_2OH,





and —C(O)OH wherein R_1 is hydrogen or hydroxy, R is C_1 to C_6 alkyl, or optionally substituted phenyl, wherein the substituents are selected from the group C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo and trifluoromethyl and R_{16} is C_1 to C_6 alkyl;

C_{13}–C_{14} is selected from the group —CH=CH—(trans) and —CH_2CH_2—; and R_2 is selected from the group



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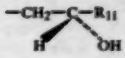
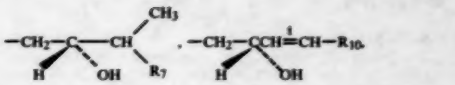
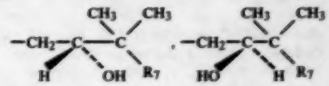
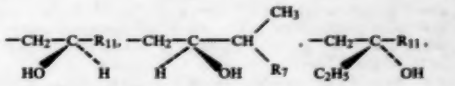
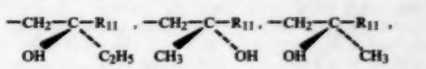
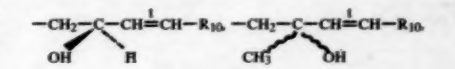


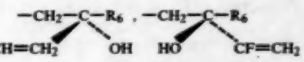


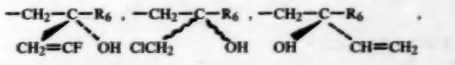


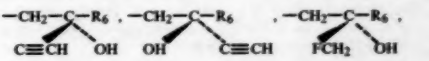


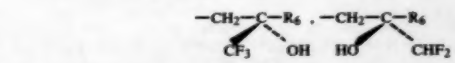


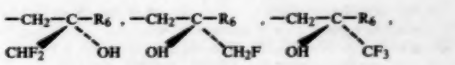


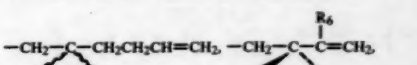


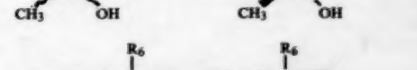


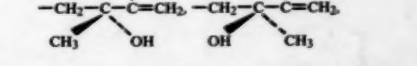


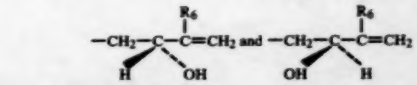


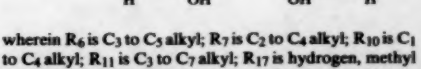


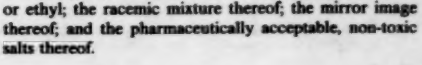












wherein R_6 is C_3 to C_5 alkyl; R_7 is C_2 to C_4 alkyl; R_{10} is C_1 to C_4 alkyl; R_{11} is C_3 to C_7 alkyl; R_{17} is hydrogen, methyl or ethyl; the racemic mixture thereof; the mirror image thereof; and the pharmaceutically acceptable, non-toxic salts thereof.

4,390,712
AQUEOUS SOLUTION OF CATIONIC ORGANOSILICON COMPOUNDS AND PROCESS FOR THE PRODUCTION OF THE SOLUTIONS

Alfons Karl, Hanau; Wolfgang Buder, Rodenbach, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,251

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047994

Int. Cl.³ C07F 7/10

U.S. Cl. 556—413 **15 Claims**

1. A process of preparing an aqueous solution of a cationic organosilicon compound, comprising reacting an alkoxysilylalkyl halide of the formula $(RO)_{3-a}R_a^1—Si—R^2—X$ (I) where R is C_1 to C_5 alkyl, methoxymethyl, ethoxyethyl, methoxyethyl, or C_5 to C_8 cycloalkyl, R^1 is C_1 to C_5 alkyl, phenyl, tolyl, benzyl, or C_5 to C_8 cycloalkyl; R^2 is a divalent ethylenic double bond free hydrocarbon group having 3 to 8 carbon atoms, n is zero, 1 or 2 and X is chlorine, bromine, or iodine with a tertiary amine of the formula $R^3NR^4R^5$ (II) where R^3, R^4, and R^5 each is an alkyl group or benzyl in which the number of carbon atoms of the alkyl group or the alkyl groups together is up to 30 or R^4 and R^5 together with the nitrogen atom or together with the nitrogen atom together with a further hetero atom selected from the group consisting of oxygen, nitrogen, and sulfur is a univalent five to eight membered heterocyclic ring having three to seven $—CH_2—$ groups in the heterocyclic ring, or R^5 is a C_3 to C_{12} cycloalkyl group in aqueous medium at a temperature from room temperature to 300° C. at a mole ratio of (I) to (II) between 1:0.8 to 1:1.2.

4,390,713
QUATERNARY AMMONIUM-FUNCTIONAL SILICON COMPOUNDS

Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed May 21, 1982, Ser. No. 380,494

Int. Cl.³ C07F 7/10

U.S. Cl. 556—418 **17 Claims**

1. A process for preparing quaternary ammonium-functional silicon compounds which comprises reacting a carbinol-functional quaternary ammonium compound with a carboxylic acid-functional silicon compound.

4,390,714
TERTIARY AROMATIC AMINE ACCELERATORS IN ACRYLIC RESIN

Harold Argentar, Rockville, Md., assignor to American Dental Association Health Foundation, Chicago, Ill.

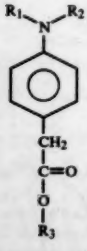
Division of Ser. No. 885,275, Mar. 10, 1978, Pat. No. 4,243,763. This application Jul. 7, 1980, Ser. No. 166,383

Int. Cl.³ C07C 101/72

U.S. Cl. 560—36 **3 Claims**

1. Tertiary aromatic amines having the following structure:

(A)

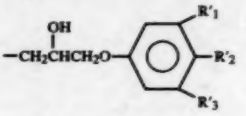


where R_1 and R_2 are the same or different and are selected from the following groups, with at least one of R_1 and R_2 always selected from group (c) and (d) or only one of R_1 and R_2 selected from group (f):

(a) $—CH_3$,

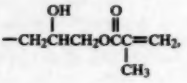
(b) $—CH_2CH_2C_aH_{2a+1}$ with n varying between 0 and 18,

(c)

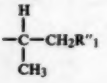


where R_1', R_2' and R_3' are each either hydrogen, normal alkyl, $—C_nH_{2n+1}$ with n varying between 1 and 20, or t-butyl, but if one R' is t-butyl, then the adjacent R' is hydrogen,

(d)



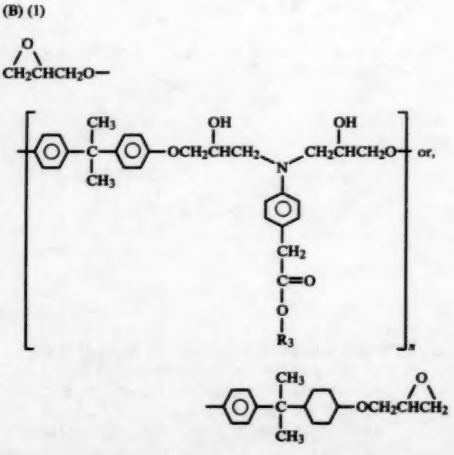
(e)



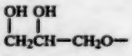
where R_1'' is $—C_nH_{2n+1}$ with n varying from 0 to 17, or

(f) $—CH_2CH_2OH$; or

(B) (1)



(B) (2)



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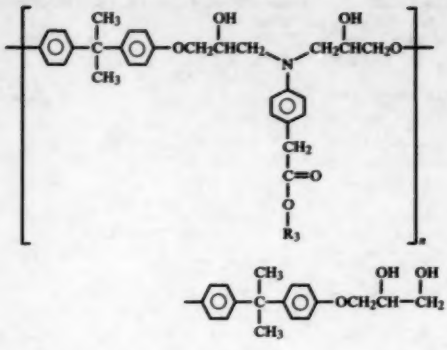
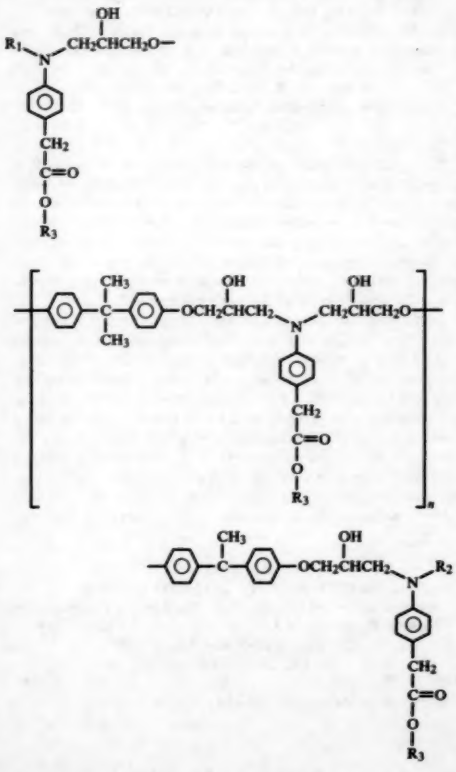


where n in each instance varies between 1 and 10; or

(C)

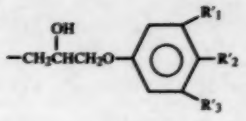


where n varies between 1 and 8, and where R_1 and R_2 are the same or different and are selected from the following groups:

(a) $-CH_3$,

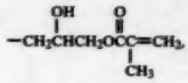
(b) $-CH_2CH_2C_nH_{2n+1}$ with n varying between 0 and 18,

(c)

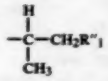


where R_1', R_2' and R_3' are each either hydrogen, normal alkyl, $-C_nH_{2n+1}$, with n varying between 1 and 20, or t-butyl, but if one R' is t-butyl, then the adjacent R' is hydrogen,

(d)



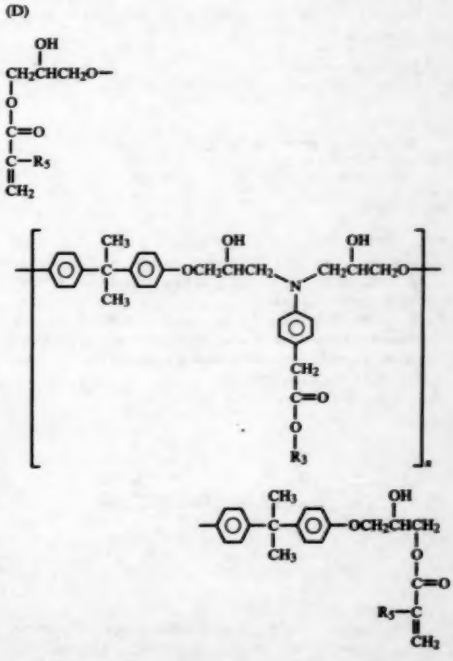
(e)



where R_1'' is $-C_nH_{2n+1}$ with n varying from 0 to 17, or

(f) $-CH_2CH_2OH$; or

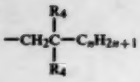
(D)



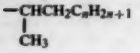
where n varies between 1 and 10 and R_5 is hydrogen or $-CH_3$;

and where R_3 is in each instance selected from one of the following groups:

(1) $-CH_3$,

(2) 

where R_4 is hydrogen or methyl and n varies between 0 and 18,

(3) 

where n varies between 0 and 17, or

(4) the substituents of subparts (A) (c), (A) (d) and (A) (f), (5) and in the case of amines of type (A), —H.

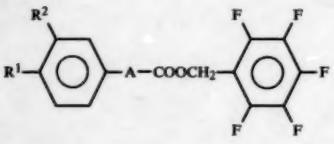
4,390,715

PENTAFLUOROBENZYL ESTERS

George Holan, Brighton, and David F. O'Keefe, Mt. Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Jul. 10, 1981, Ser. No. 282,190
Claims priority, application Australia, Jul. 18, 1980, PE4608
Int. Cl.³ C07C 69/76
U.S. Cl. 424—282 16 Claims

1. The (+), (−) and (±) forms of the compounds of the general formula (I)



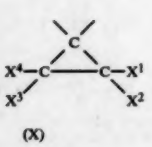
(I)

characterised in that

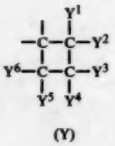
R^1 is a halo group; or a lower alkyl, lower alkoxy or lower alkylthio group, each of which may be substituted with one or more halo groups;

R^2 is hydrogen or a methyl group; or R^1 and R^2 together form a methylenedioxy, or a difluoromethylenedioxy group or, with the carbon atoms to which they are attached, an aromatic ring; and

A is one of the groups X or Y



(X)



(Y)

wherein

X^1 and X^2 are the same or different and each is hydrogen or a fluoro, chloro, bromo or methyl group, with the proviso that if X^1 is a fluoro group, then X^2 should not be a bromo group; and X^3 and X^4 are the same or different and each is hydrogen or a fluoro group; and

Y^1, Y^2, Y^3, Y^4, Y^5 and Y^6 are the same or different groups and each is hydrogen or a fluoro, bromo, chloro, or methyl group.

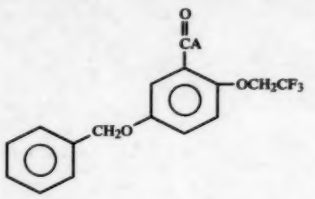
4,390,716

PHENOLIC DERIVATIVE

Elden H. Banitt, Woodbury, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 271,253, Jun. 8, 1981, Pat. No. 4,339,587.
This application May 5, 1982, Ser. No. 375,176
Int. Cl.³ C07C 69/76
U.S. Cl. 560—65 4 Claims

1. A compound of the formula



in which A is selected from OCH_2CH_3, OH and Cl.

4,390,717

PROCESS FOR PREPARING CARBOXYLIC ACID ESTERS OF DICYCLOPENTADIENES

Katuhiro Ishikawa, Yokkaichi; Ryotaro Ohno, Tokyo, and Masatoshi Arakawa, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,152
Claims priority, application Japan, Apr. 30, 1980, 55/57672
Int. Cl.³ C07L 67/38
U.S. Cl. 560—114 21 Claims

1. A process for preparing a monocarboxylic ester of a dicyclopentadiene by reacting the dicyclopentadiene with carbon monoxide at a pressure of at least 30 kg/cm² and an alcohol in the presence of a cobalt compound catalyst, characterized by carrying out said reaction at a temperature of 130° or less in the presence of a pyridine base in an amount of 0.5 mole or more per mole of the dicyclopentadiene to hydroesterify the double bond of the norbornene ring.

2. A process for preparing a dicarboxylic ester of a dicyclopentadiene by reacting the dicyclopentadiene with carbon monoxide at a pressure of at least 30 kg/cm² and an alcohol in the presence of a cobalt compound catalyst, characterized by carrying out said reaction at a temperature of 130° C. or less in the presence of a pyridine base in an amount of 0.5 mole or more per mole of the dicyclopentadiene to hydroesterify the double bond of the norbornene ring, thereby preparing a monocarboxylic ester of the dicyclopentadiene, and subsequently hydroesterifying the remaining double bond of said ester to prepare a dicarboxylic ester of the dicyclopentadiene.

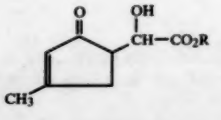
4,390,718

PROSTAGLANDIN INTERMEDIATES

Percy Manchand, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 1, 1981, Ser. No. 279,492
Int. Cl.³ C07C 59/46, 69/732
U.S. Cl. 560—122 4 Claims

1. A compound of the formula:



wherein R represents hydrogen or a lower alkyl.

4,390,719

1-METHYL-2-CHLOROCYCLOPROPANECARBOXYLIC ACID AND ITS ESTER

Werner Schwarze, Frankfurt; Axel Kleemann, Hanau, and Wolfgang Leuchtenberger, Bruchkobel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

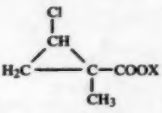
Filed Jul. 6, 1981, Ser. No. 280,356

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026093

Int. Cl.³ C07L 61/04, 69/74

U.S. Cl. 560—124 3 Claims

1. A 1-methyl-2-chlorocyclopropane compound of the formula



in which X is a hydrogen atom or a 1–6 carbon atom alkyl group.

4,390,720

ALKYL-ω-FLUOROFORMYL ESTER AND PROCESS

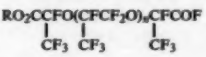
Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1981, Ser. No. 311,312

Int. Cl.³ C07C 67/31, 67/317, 69/708

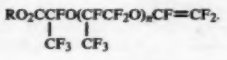
U.S. Cl. 560—184 16 Claims

1. A process for making esters of the formula

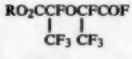


wherein R is CH_3 or C_2H_5 and n is 0 or an integer from 1 to 3, comprising reacting the methyl or ethyl ester of trifluoropyruvic acid with hexafluoropropene oxide in the presence of fluoride ion catalyst, in an aprotic liquid medium.

15. A process according to claim 1 comprising the additional step of pyrolyzing the esters to form vinyl ether monomers of the formula



16. An ester of the formula:



wherein R is CH_3 or C_2H_5.

4,390,721

3-ENDO-PROTECTED HYDROXYL-TRICYCLO[3,2,0,0^{2,7}]HEPTAN-6-ONES

Stanley M. Roberts, Macclesfield, England, assignor to Allen & Hanburys Limited, England

Division of Ser. No. 746,741, Dec. 2, 1976, Pat. No. 4,134,911. This application Nov. 1, 1978, Ser. No. 956,676

Claims priority, application United Kingdom, Dec. 3, 1975, 49686

Int. Cl.³ C07D 309/12; C07C 69/013, 69/14, 49/517, 49/753

U.S. Cl. 560—256 6 Claims

1. A compound of formula (II)

(II)

wherein R represents an alkanoyl group containing not more than 7 carbon atoms; an aralkanoyl or aroyl group containing not more than 20 carbon atoms; or an alkyl, C_{1-6} alkoxy-alkyl, C_{1-6} alkoxy-C_{1-6} alkoxyalkyl, aralkyl, cycloalkyl group or tetrahydropyranyl group.

4,390,722

RESOLUTION OF AMINO ACIDS

Meir Lahav; Lia Addadi, and Isabela Weissbuch, all of Rehovot, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Jun. 1, 1981, Ser. No. 268,804

Claims priority, application Israel, Jun. 8, 1980, 60254

Int. Cl.³ C07B 19/00

U.S. Cl. 562—402 5 Claims

1. A process for resolution of a mixture of D- and L-forms of asparagine, whereby the ratio of one desired enantiomorph to the other undesired enantiomorph of said asparagine is increased in the crystalline compound obtained, as compared to the ratio in the starting material, which process comprises forming a supersaturated solution of said mixture, adding D-glutamic acid, D-aspartic acid or D-glutamine as crystallization inhibitor of the D-form when the L-form of asparagine is desired, or including the L-form of these additives when the D-form of asparagine is desired; and crystallizing a portion of the asparagine from said supersaturated solution.

4,390,723

PROCESS FOR PRODUCING HYDROXYPHENYL ALIPHATIC ACID DERIVATIVES

Masahiro Matsuno, Fuji; Yasushi Higuchi; Yutaka Ohishi, both of Shizuoka; Yoshiki Nakayama, Shimizu, and Chihiro Yazawa, Yokohama, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

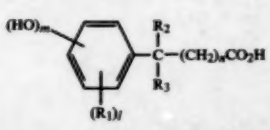
Filed Aug. 5, 1981, Ser. No. 290,305

Claims priority, application Japan, Aug. 29, 1980, 55/118401; Feb. 12, 1981, 56/19510

Int. Cl.³ C07C 65/01

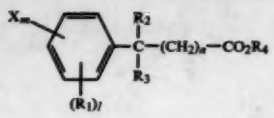
U.S. Cl. 562—478 8 Claims

1. In a process for producing a hydroxyphenyl aliphatic acid derivative having the formula



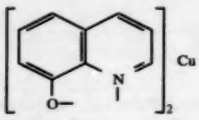
(I)

wherein R_1 represents hydrogen atom, a lower alkyl group, a lower alkoxy group, hydroxy group or a lower alkylcarbonyl group; R_2 and R_3 are the same or different and respectively represent hydrogen atom or a lower alkyl group; and m is 1 or 2; l is 0, 1 or 2; n is 0, 1 or 2; by reacting a halophenyl aliphatic acid derivative having the formula



(II)

wherein R_1, R_2, R_3, m, l and n are defined above and R_4 represents hydrogen atom or a monovalent hydrocarbon moiety; and X represents a halogen atom, with a base an improvement characterized by reacting them in the presence of a catalyst of bis(8-quinolinolate) copper (II) complex having the formula



4,390,724

PROCESS FOR THE PREPARATION OF 3-FORMYL-4-R_2R_3-BUT-3-ENE-1-OIC ACIDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

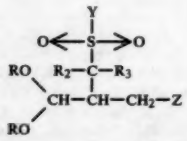
Division of Ser. No. 246,170, Mar. 23, 1981. This application Apr. 16, 1982, Ser. No. 369,145

Claims priority, application France, Mar. 28, 1980, 80 06978

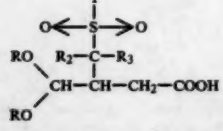
Int. Cl.³ C07C *61/35, 59/74*

U.S. Cl. 562—504 **3 Claims**

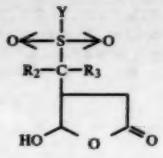
1. A process for the preparation of a 3-formyl-4-R_2R_3-but-3-ene-1-oic acid comprising reacting a compound of the formula



wherein Y is a monocyclic aromatic group, R_2 and R_3 are individually alkyl of 1 to 4 carbon atoms or taken together with the carbon atom to which they are attached form a carbon homocycle of 3 to 6 carbon atoms, the Rs are alkyl of 1 to 6 carbon atoms or together form a polymethylene of 2 to 3 carbon atoms and Z is selected from the group consisting of cyano and —$COOR_1$ wherein R_1 is alkyl of 1 to 6 carbon atoms with a basic agent capable of saponifying the ester group or a hydrolysis agent capable of converting —CN to —COOH to obtain a compound of the formula



wherein R, R_2, R_3 and Y have the above definition, reacting the latter with an acid agent capable of hydrolyzing the ketal group to obtain a compound of the formula



and reacting the latter with a basic agent to obtain a 3-formyl-4-R_2R_3-but-3-ene-1-oic acid.

4,390,725

OXYDEHYDROGENATION PROCESS FOR PREPARING METHACRYLIC ACID AND ITS LOWER ALKYL ESTERS

Cheiliah Daniel, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 19, 1981, Ser. No. 322,824

Int. Cl.³ C07C *51/377, 57/05, 67/317, 69/54*

U.S. Cl. 562—599 **3 Claims**

1. In a process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding α,β-olefinically unsaturated derivative by oxydehydrogenation wherein a catalyst is contacted with a gaseous feed stream containing said acid or ester and molecular oxygen at a temperature between about 300° and 500° C.; the improvement comprising using as catalyst a material having the gram-atom empirical formula $Cu_aFe_bP_cO_x$ wherein a is 0.01–1.0, b is 0.01–1.0, c is 0.01–2.0, and x is determined by satisfying the sum of the unshared positive valences of the other elements shown in the formula.

4,390,726

PROCESS FOR THE PRODUCTION OF GUANIDINE NITRATE FROM A MIXTURE OF UREA AND AMMONIUM NITRATE AND APPARATUS FOR ITS PERFORMANCE

Matthias Thoma, Waldkraiburg, Fed. Rep. of Germany, assignor to Industrie Chemie Thoma GmbH & Co. Produktions KG, Waldkraiburg, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,512

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011333

Int. Cl.³ C07C *128/00*

U.S. Cl. 564—242 **17 Claims**

1. In a process for the manufacture of guanidine nitrate wherein urea is reacted with ammonium nitrate in the presence of silica gel, the improvement comprising carrying out a reaction of said urea and ammonium nitrate wherein the initial mixture of urea and ammonium nitrate contains about a 1:2 weight ratio of urea to ammonium nitrate, heating the initial mixture to an elevated temperature of about 5°–20° C. above the reaction temperature of the urea and ammonium nitrate reactants not exceeding a maximum temperature of about 210° C., separating the formed guanidine nitrate from the reaction mixture, and gradually adding urea to the reaction mixture in such quantities relative to the reaction mixture such that the weight ratio of urea to ammonium nitrate is always about 1:2 up to the final phase of the reaction wherein 90–93% of urea has been consumed, after which the ratio of reactants increases in favor of ammonium nitrate.

4,390,727

PROCESS FOR PREPARING STABLE AQUEOUS SUSPENSIONS OF FORMALDEHYDE

Angelo De Michell, Saronno, and Piero Bizzozero, Samarate, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 29, 1981, Ser. No. 288,116
Claims priority, application Italy, Nov. 19, 1976, 29549 A/76
Int. Cl.³ C07C 47/058
U.S. Cl. 568—422 16 Claims

1. A stable, fluid and homogeneous suspension, containing from 40 to 60% by weight of formaldehyde in water, in which a portion of the formaldehyde is present in the form of soluble monomer and/or oligomers, the remnant of the formaldehyde, amounting to 5 to 25% by weight, with respect to the whole suspension, being present in the form of undissolved but thermally re-dissolvable polymers of the formaldehyde, which polymers do not settle after at least ten days at temperatures equal to or higher than 20° C., said suspension being obtained by heating a starting aqueous solution, containing from 40 to 60% by weight of formaldehyde at temperatures from 40° to 80° C. under stirring, then admixing with it, at such temperatures, a stabilizing combination of polyvinyl-alcohol and of a guanamine selected from the group consisting of benzoguanamine, m-phthalo-bis-guanamine and lauroguanamine, adjusting the pH to a value from 0.5 to 1.5 or from 6.0 to 8.0, cooling the mixture to a temperature from 10° to 40° C., maintaining such cooled mixture under stirring for a time comprised between 4 and 24 hours, and finally adjusting the pH of the cooled mixture between 3.0 and 4.0.

4,390,728

PROCESS FOR CONVERSION OF TOLUENE TO BENZALDEHYDE

Cheliiah Daniel, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 7, 1981, Ser. No. 328,290
Int. Cl.³ C07C 45/33
U.S. Cl. 568—431 4 Claims

1. A process for the catalytic oxidation of toluene to benzaldehyde comprising contacting a catalyst with a gaseous feed stream containing toluene and oxygen at a temperature in the range of from 475° C. to 550° C. wherein the catalyst is one conforming to the empirical formula $Cu_aFe_bU_cPb_dP_eTe_f$. Mo_gO_x wherein a is 0.5–6.0, b is 0.5–2.0, c is 0.5–6.0, d is 0.05–1.0, e is 0.01–2.0, f is 0.1–2.0, g is 6–12, and x represents a number determined by satisfying the sum of the unshared positive valences of the other elements shown in the formula.

4,390,729

PROCESS FOR CARBONYLATION USING TETRAALKYL PHOSPHONIUM SUBSTITUTED PHOSPHINE AND AMINE TRANSITION METAL COMPLEXES AS CATALYST

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 114,627, Jan. 23, 1980, Pat. No. 4,302,401.
This application Nov. 3, 1980, Ser. No. 204,245
Int. Cl.³ C07C 45/50; C07F 15/00
U.S. Cl. 568—454 15 Claims

1. A process for carbonylation comprising reacting an organic compound capable of being carbonylated with CO in the presence of a catalyst complex of the formula:

$$[(R_2DQ)_bP^+R^1{}_{4-b}Z^-]_g(MX_n)_r$$

wherein each R is independently selected from an alkyl group containing from 1 to 30 carbon atoms and an aryl group containing from 6 to 10 carbon atoms; D represents a member selected from P and N atoms; Q is a divalent organic radical selected from an alkylene radical and an alkylene radical the carbon chain of which is interrupted with ether oxygen or phenylene group, wherein said alkylene radical contains from 1 to 30 carbon atoms; R^1 represents an alkyl group containing from 1 to 30 carbon atoms, wherein said R1 groups can be the same or different; b is an integer of from 1 to 4; Z^- is an anion; M represents a Group VIII metal atom; X is an anion or organic ligand satisfying the coordination sites of the metal M; b times g is 1 to 6; n is 2 to 6; and s is 1 to 3.

4,390,730

FORMALDEHYDE PRODUCTION

H. Robert Gerberich, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,384
Int. Cl.³ C07C 45/052
U.S. Cl. 568—473 20 Claims

1. In a process for the production of formaldehyde by oxidative dehydrogenation of methanol vapor with oxygen at elevated temperatures, the improvement which comprises passing a mixture of methanol and an oxygen-containing gas over a catalyst comprising silver and lead.

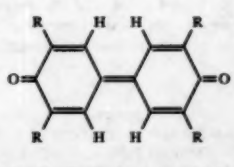
4,390,731

POLYMERIC PHENOLIC BENZYLIC ETHER COMPOSITIONS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

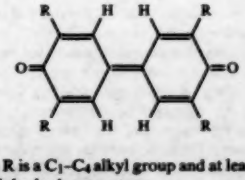
Continuation-in-part of Ser. No. 177,937, Aug. 14, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,147
Int. Cl.³ C07C 43/20, 41/01
U.S. Cl. 568—643 9 Claims

1. The polymeric phenolic benzyl ether composition obtained by heating at a temperature of from about 150° C. to about 250° C. for a period of time of about 0.25 to 2.5 hours an alkyl-substituted diphenoquinone having the formula,



wherein each R is a C_1–C_4 alkyl group and at least one R group contains an alpha hydrogen atom.

6. A process for obtaining polymeric substituted benzyl ether compositions which comprises heating for a period of time of from about 0.25 to 2.5 hours at a temperature of from about 150° C. to about 250° C. an alkyl-substituted diphenoquinone having the formula,



wherein each R is a C_1–C_4 alkyl group and at least one R group contains an alpha hydrogen atom.

4,390,732
PROCESS FOR THE PRODUCTION OF GUAIACOL GLYCERINE ETHER

Wolfgang Merk, Hanau; Rüdolf M. Wagner, Illertissen; Peter Werle, Geinhausen, and Robert S. Nygren, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 10, 1982, Ser. No. 347,482
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3106995
Int. Cl.³ C07C *41/03*
U.S. Cl. 568—648 20 Claims

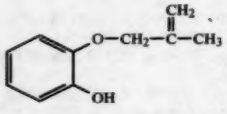
1. A process for the production of guaiacol glycerine ether comprising reacting o-methoxyphenol with glycidol in the presence of a catalyst selected from the group consisting of alkali metal hydroxides, alkali metal alcoholates, alkali metal cyanates, alkali metal thiocyanates and mixture thereof.

4,390,733
PROCESS FOR PREPARING THE MONO-METHALLYL ETHER OF PYROCATECHIN

Stefano Campolmi, Novara; Vittorio Carletti, Meda, and Marcello Marchi, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 14, 1981, Ser. No. 263,598
Claims priority, application Italy, May 16, 1980, 22129 A/80
Int. Cl.³ C07C *41/16*
U.S. Cl. 568—652 17 Claims

1. A process for preparing the mono-methallyl ether of pyrocatechin of formula (I)



(I)

characterized in that pyrocatechin is reacted with a methallyl halide in a homogeneous hydroxylated dissolving medium selected from the group consisting of water, C_1–C_5 saturated and unsaturated aliphatic mono-alcohols, and alcohols having the formula: $RO[(CH_2)_nO]_mH$, wherein R is selected from the group consisting of hydrogen and C_1–C_{10} alkyl groups and m and n are integers from 1 to 10, with the proviso that n is at least 2, or mixtures thereof, in the presence of an organic or inorganic base, and at temperatures in the range from about 30° to about 120° C.

4,390,734
PROCESS FOR PRODUCING PROPYLENE GLYCOL MONOALKYL ETHERS FROM ACETALDEHYDE, AN ALKANOL AND SYNGAS USING A NEW CATALYST SYSTEM

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,234
Int. Cl.³ C07C *41/01*
U.S. Cl. 568—678 21 Claims

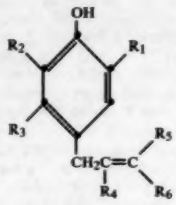
1. A process for producing propylene glycol monoalkyl ethers from acetaldehyde and an alkanol or acetal which comprises contacting a mixture of acetaldehyde and alkanol, or an equivalent acetal, with carbon monoxide and hydrogen in the presence of a catalytic amount of a catalyst consisting of a cobalt-containing compound and a cocatalyst selected from the group consisting of rhodium-containing compounds, ruthenium-containing compounds, and nickel-containing compounds, and heating the mixture at moderate temperatures and moderaate pressures for sufficient time to produce the desired glycol monoalkyl ether, and then recovering the same from the reaction mixture.

4,390,735
PROCESS FOR THE PREPARATION OF P-ALLYLPHENOLS

Siegfried Rosenberger, Rieben, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,709
Claims priority, application Switzerland, Oct. 22, 1980, 7873/80
Int. Cl.³ C07C *37/18, 37/11*
U.S. Cl. 568—790 11 Claims

1. A process for the preparation of a p-allylphenol, which is substituted in the ortho-position, of formula I



(I)

wherein

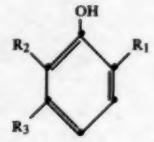
R_1 is C_1–C_{12} alkyl, phenyl, C_7–C_9 aralkyl or C_5–C_7 cycloalkyl,

R_2 is hydrogen, chlorine, C_1–C_{12} alkyl, phenyl, C_7–C_9 aralkyl or C_5–C_7 cycloalkyl,

R_3 is hydrogen or methyl, R_4, R_5 and R_6 independently of one another are hydrogen, phenyl, or C_1–C_{20} alkyl, with the proviso that, as alkyl radicals, R_4, R_5 and R_6 in total contain 1 to 20 C atoms, and which is essentially free of allyl aryl ether,

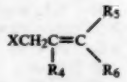
which comprises

reacting a phenol of formula II



(II)

where R_1, R_2 and R_3 are defined as above, with an allyl halide of formula III



(III)

where R_4, R_5 and R_6 are defined as above, and X is halogen,

in a molar equivalent ratio of phenol to allyl halide of 2:1 to 1:2,

in the presence of a base selected from the group consisting of the alkali metal hydroxides, the alkali metal carbonates and the alkali metal alcoholates having 1 to 6 carbon atoms, with at least one mol equivalent of base for each mol equivalent of phenol,

at a temperature of 0° to 130° C., and in the presence of 0.001 to 50 mol. %, based on the phenol of formula II, of a phase transfer catalyst selected from the group consisting of the quaternary salts, cyclic polyethers, open-chain polyethers, N-alkylphosphoramides, methylene-bridged phosphorus oxides and methylene-bridged sulfur oxides.

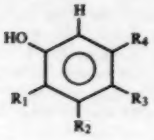
4,390,736

PROCESS FOR PRODUCING PHENOLS

Yasuhiko Inoue, Nilhama; Shigeo Wake, Saijo; Tamio Sirafuji, Chiba, and Masazo Beppu, Nilhama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

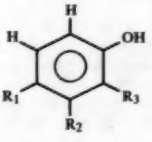
Filed Nov. 10, 1981, Ser. No. 320,106
Claims priority, application Japan, Nov. 26, 1980, 55-167083; Feb. 27, 1981, 56-29149; Aug. 21, 1981, 56-131693
Int. Cl.³ C07C 37/01
U.S. Cl. 568—801 7 Claims

1. A method for the production of phenol or nucleus-substituted phenols of the formula (II),



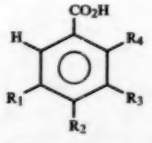
(II)

wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom or a methyl group, and/or the formula (III),



(III)

wherein R_1, R_2 and R_3 are as defined above, comprising the step of catalytically oxidizing benzoic acid or nucleus-substituted benzoic acids of the formula (I),



(I)

wherein R_1, R_2, R_3 and R_4 are as defined above, in gas phase with an oxygen containing gas at a temperature of 200°–600° C. and with pressures at or above atmospheric, using an oxide catalyst of the formula,

$$Mo_aW_bX_cY_dZ_eO_f$$

wherein Mo is molybdenum, W is vanadium, X is at least one of copper, silver, manganese, iron, cobalt, nickel, rhodium, palladium, and platinum, Y is at least one of cerium, uranium, zirconium, chromium, tungsten, zinc, cadmium, tin, phosphorus, antimony, bismuth, and tellurium, Z is at least one of thallium, alkali metals, and alkaline earth metals, and when a is fixed to 12, b is 0.1 to 60, c is 0.1 to 60, d is 0 to 24, e is 0.1 to 120 and f is the number of oxygen atoms satisfying the valence of other elements.

4,390,737

PROCESS FOR THE ORTHO-ALKYLATION OF PHENOLIC COMPOUNDS

Akihide Kudoh; Motoo Kawamata; Kazushi Okahima; Makoto Kotani, all of Yokohama; Takeshi Tsuda, Kanagawa, and Satoshi Morita, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,781
Claims priority, application Japan, Nov. 17, 1980, 55-160687
Int. Cl.³ C07C 37/16
U.S. Cl. 568—804 8 Claims

1. In a process for the selective ortho-alkylation of a phenolic compound having at least one ortho-positioned hydrogen atom by catalytically reacting the phenolic compound with a saturated aliphatic alcohol having from 1 to 4 carbon atoms in the vapor phase at a temperature of from 300° C. to 550° C., the improvement of which comprises carrying out the reaction in the presence of a catalyst containing manganese oxide, silicon oxide and one or more additives selected from group (A) consisting of germanium oxide, tin oxide and lead oxide, the silicon oxide in the catalyst being present in such proportion as to provide an atomic ratio of manganese to silicon ranging from 100:0.01 to 100:20, said additives selected from the group (A) being present in such proportion as to provide an atomic ratio of manganese to said metal additives ranging from 100:0.1 to 100:50.

4,390,738

PROCESS FOR THE OXIDATION OF OLEFINIC COMPOUNDS TO OLEFINE OXIDES OR DERIVATIVES THEREOF

Dhafir Y. Waddan, Whalley Range, and Derek Williams, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 18, 1981, Ser. No. 274,797
Claims priority, application United Kingdom, Jun. 26, 1980, 8020976
Int. Cl.³ C07C 31/20, 33/04; C07D 301/06, 301/08
U.S. Cl. 568—857 9 Claims

1. A process for the oxidation of an olefine to an olefine oxide which comprises reacting an olefine selected from the group consisting of C_2 to C_4 mono-olefines and butadiene with oxygen in the presence of a copper catalyst which contains copper atoms to each one of which is bonded one or more peroxo groups thereby producing an olefine oxide.

9. A process according to claim 1 in which water is present and the olefine oxide is converted to the corresponding glycol.

4,390,739

HYDROXYLATION OF OLEFINS

Robert C. Michaelson, Waldwick, and Richard G. Austin, Ridgewood, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 9, 1981, Ser. No. 310,097
Int. Cl.³ C07C 31/20, 31/22, 33/20, 31/42
U.S. Cl. 568—860 9 Claims

1. A process for hydroxylating at least one olefinic compound having at least one ethylenic unsaturation which comprises reacting said olefinic compound with oxygen and water in the presence of a catalyst composition in a manner and under conditions sufficient to convert at least one of said ethylenic unsaturation to its corresponding diol, said catalyst composition comprising:

(a) at least one catalytically active metal oxide wherein the metal of said oxide is selected from the group consisting of Os, Ti, Zr, Nb, Mo, W, Ru, Re, and Ir;

(b) at least one co-catalyst I transition metal salt having a cation and an anion wherein said cation is of a transition metal independently selected from the group consisting of Fe, Co, Ni, Cu, V, Cr, Mn, Sc, Ti, Mo, Ru, Rh, Pd, and W; and said anion is of a member independently selected from the group consisting of halide, carboxylate, aryloate,

aryolate, pseudo halide, R_5S^-, HS^-, R_5Se^-, HSe^-, HTe^-, and R_5Te^-, R_5 being alkyl of from about 1 to about 10 carbons; and

(c) optionally at least one co-catalyst II having a cation and an anion wherein said cation is of a member independently selected from the group consisting of alkali metal, alkaline earth metal, tetra hydrocarbyl ammonium, and tetra hydrocarbyl phosphonium, said hydrocarbyl group being selected from the group consisting of substituted and unsubstituted alkyl, aryl, alkaryl, and aralkyl and said anion is of a member independently selected from the group consisting of halide, carboxylate, aryloate, aryolate, pseudo halide, hydroxyl, R_5S^-, HS^-, R_5Se^-, HSe^-, HTE^-, and R_5Te^-, said R_5 being alkyl as defined above.

4,390,740

PROCESS FOR PREPARING FLUOROBENZENE

Iwao Tabushi, Kyoto; Kazuhiro Shimokawa, Yame; Daiji Naito, Ibaraki; Susumu Misaki, Mino, and Tsutomu Yoshida, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 10, 1981, Ser. No. 329,434

Claims priority, application Japan, Dec. 13, 1980, 55-176132; Dec. 28, 1980, 55-186638

Int. Cl.³ C07C *17/10*

U.S. Cl. 570—146 **4 Claims**

1. A process for preparing monofluorobenzene which comprises reacting cyclopentadiene or its dimer of the formula:

with fluorohalomethane of the formula:

$CHFX_2$

wherein Xs are, same or different, halogen atoms in the presence of a phase transfer catalyst and an acid acceptor at a temperature of from 0° C. to 250° C.

4,390,741

PROCESS FOR THE PURIFICATION OF DIISOPROPENYLBENZENE

Howard A. Colvin, Akron, and Joel Muse, Jr., Kent, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 3, 1982, Ser. No. 414,706

Int. Cl.³ C07C *7/04*

U.S. Cl. 585—258 **7 Claims**

1. A process for the separation of diisopropenylbenzene from organic impurities in a dehydrogenation mixture comprising: (1) hydrogenating said dehydrogenation mixture to a maximum isopropenylstyrene concentration of no more than about 5 percent by weight in the presence of a rhodium catalyst and hydrogen to form a hydrogenated dehydrogenation mixture, followed by, (2) fractionally distilling said hydrogenated dehydrogenation mixture under conditions sufficient to separate said diisopropylbenzene from said organic impurities in said hydrogenated dehydrogenation mixture.

4,390,742

REDUCTION OI CYCLOPENTADIENE FROM ISOPRENE STREAMS

Lawson G. Wideman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 22, 1982, Ser. No. 350,915

Int. Cl.³ C07C *7/01, 7/12*

U.S. Cl. 585—854 **8 Claims**

1. A process for reducing the level of cyclopentadiene present in a C-5 hydrocarbon stream containing no carbonyl compounds comprising forming the respective insoluble salt by contacting said stream with an alkali metal hydroxide, said alkali metal hydroxide being selected from the group consisting of sodium hydroxide, potassium hydroxide, and lithium hydroxide.

4,390,743

SILICON LAYER SOLAR CELL AND METHOD OF PRODUCING IT

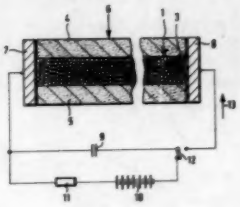
Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,322

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035563

Int. Cl.³ H01L *31/18*

U.S. Cl. 136—258 16 Claims



1. A method of producing a silicon layer solar cell having an active silicon layer applied to a surface of a low resistance silicon substrate, said method comprising: forming a low resistance silicon substrate using powder metallurgy by producing a compacted silicon powder member, and sintering or fusing the compacted silicon powder member at a sufficiently high temperature by passing an electrical current through the compacted silicon powder member; and applying an active silicon layer to a surface of the said silicon substrate.

13. A silicon layer solar cell produced according to the method of claim 1.

4,390,744

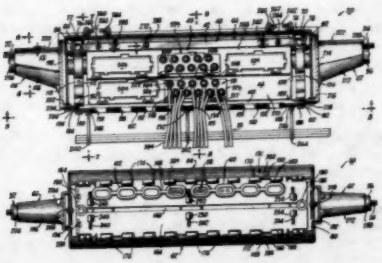
FIXED COUNT TERMINAL

Louis Suffi, Westchester; James E. Golden, Evanston, and Frederick W. Burtelson, Harvard, all of Ill., assignors to Northern Telecom, Inc., Nashville, Tenn.

Filed Dec. 12, 1980, Ser. No. 215,708

Int. Cl.³ H02G *7/08, 15/113, 15/117;* H01R *9/00*

U.S. Cl. 174—41 47 Claims



1. A combination of a cable terminal and a communication cable having a support strand portion and a cable conductor portion, said combination comprising:

a base means,

a support means affixed to said support strand portion of said cable and to which said base means is affixed,

a wall means supported by said support means and said base means, said wall means dividing said terminal into a cable compartment in which said communication cable including said support strand portion and said cable conductor portion is disposed and a terminal compartment, and terminal means mounted on said wall means and extending into said terminal compartment.

10. A cable terminal for use with a communication cable having a plurality of conductors, said cable terminal comprising:

a base means,

a support means to be affixed to said cable,

a wall means supported by said support means and said base means, said wall means having at least one opening, and

terminal means mounted on said wall means, said terminal means having a terminal side from which extends a plurality of terminals and a cable side from which extends a plurality of connecting means consisting of a plurality of connecting wires extending through a retainer ring projecting from said terminal means, each of said connecting wires being coupled to a particular one of said plurality of terminals and each of said connecting wires being adapted to be connected to an individual one of the plurality of conductors within the communication cable.

4,390,745

ENCLOSURES FOR ELECTRICAL APPARATUS, CABLE AND ENCLOSURE COMBINATIONS, AND KITS AND METHODS FOR THEIR CONSTRUCTION

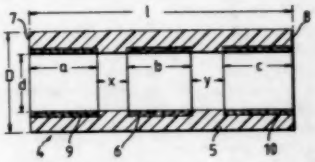
Bodo K. Böttcher, Zornedng, and Manfred O. Wilck, Neubberg, both of Fed. Rep. of Germany, assignors to Raychem GmbH, Putzbruan, Fed. Rep. of Germany

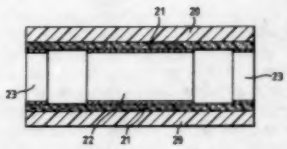
Filed Nov. 30, 1979, Ser. No. 98,900

Claims priority, application United Kingdom, Dec. 1, 1978, 46786/78

Int. Cl.³ H02G *15/064, 15/184*

U.S. Cl. 174—73 R 39 Claims





1. A recoverable enclosure containing a shielded electric cable, wherein said cable comprises: a conductor, dielectric means surrounding said conductor, and shielding means surrounding said dielectric means, the dielectric means being cut back to expose a length of the conductor and the shielding means being cut back to expose a length of the dielectric means; and wherein said enclosure comprises: a first tubular recoverable article having an inner component of stress-grading material, said stress-grading material carrying a layer of electrically conductive material on its innermost surface, and an outer component of electrically insulating material; and a second tubular recoverable article having an inner component of electrically insulating material and an outer component of electrically conducting material; said first article being recovered into close conformity around said cable such that the inner stress-grading component of said first article is in electri-

cal connection with said shielding means of the cable and extends over the dielectric means of the cable, and said second article being recovered around said first article such that said insulating components of both articles are in close conformity with each other.

16. A recoverable enclosure containing a shielded electric cable, wherein said cable comprises: a conductor, dielectric means surrounding said conductor, and shielding means surrounding said dielectric means, the dielectric means being cut back to expose a length of the conductor and the shielding means being cut back to expose a length of the dielectric means; and wherein said enclosure comprises: a first tubular recoverable article having an outer component of electrically insulating material, a first inner component of stress-grading material, and a second inner component of electrically conductive material, said first and second components being located substantially laterally of each other; and a second tubular recoverable article having an inner component of electrically insulating material and an outer component of electrically conducting material; said first article being recovered into close conformity around said cable such that the inner stress-grading component of said first article is in electrical connection with said shielding means of the cable and extends over the dielectric means of the cable, and said second article being recovered around said first article such that said insulating components of both articles are in close conformity with each other.

26. A kit of parts for use in preparing an enclosure for electrical apparatus comprising first and second hollow articles each having at least one open end, the first hollow article being capable of being positioned about and of being brought into close conformity with the electrical apparatus and comprising a hollow stress grading component within and substantially axially aligned with a hollow electrically insulating component integral therewith, the stress grading component carrying a layer of electrically conductive material on its innermost surface, and the second hollow article being capable of being positioned about and of being brought into close conformity with the first hollow article, when said first hollow article is installed on the electrical apparatus, the second hollow article comprising a hollow electrically insulating component within and substantially axially aligned with a hollow electrically conductive component.

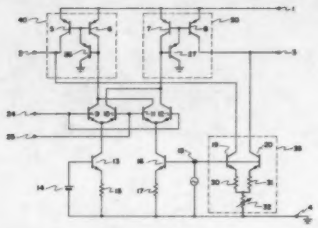
29. A kit of parts for use in preparing an enclosure for electrical apparatus, comprising first and second hollow articles each having at least one open end, the first hollow article being capable of being positioned about and of being brought into close conformity with the electrical apparatus and comprising an outer component of electrically insulating material, a first inner component of stress grading material and a second inner component of electrically conductive material, said first and second components being located substantially laterally of each other, and the second hollow article being capable of being positioned about and of being brought into close conformity with the first hollow article, when said first hollow article is installed on the electrical apparatus, the second hollow article comprising a hollow electrically insulating component within and substantially axially aligned with a hollow electrically conductive component.

36. A method of enclosing at least one shielded electrical cable which comprises positioning about each said electrical cable a first tubular article comprising an electrically insulating outer component and an inner component of stress grading material integral therewith, said stress grading material carrying a layer of electrically conductive material on its innermost surface, bringing the article into close conformity with each said electrical cable, positioning about the installed first article a second tubular article comprising a hollow electrically insulating component within and substantially axially aligned with an electrically conductive component, and bringing the second article into close conformity with the first article.

4,390,746
STEREO SIGNAL DEMODULATOR HAVING AN IMPROVED SEPARATION CHARACTERISTIC

Naotoshi Higashiyama, and Kazuyuki Doi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1980, Ser. No. 182,646
Claims priority, application Japan, Aug. 31, 1979, 54-111335
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GE 11 Claims

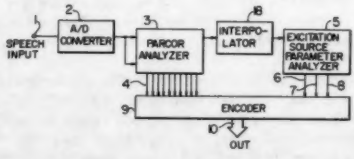


1. A stereo signal demodulator comprising an input terminal supplied with a stereo composite signal, a first transistor having a base coupled to said input terminal and an emitter coupled to a reference potential by way of a resistor, switching citrcuit means coupled to receive a collector output of said first transistor and alternately coupled to generate an output signal at its first and second output ends in response to first and second switching signals, said first switching signal having a phase opposite to the phase of said second switching signal, left and right channel output terminals coupled to said first and second output ends of said switching circuit means, respectively, the output signal generated at said first output end of said switching circuit means comprising essentially a left channel signal and a right channel crosstalk signal, the output signal generated at said second output end of said switching circuit means comprising essentially a right channel signal and a left channel crosstalk signal, crosstalk cancellation circuit means having second and third transistors each having a base coupled to said input terminal and a resistor circuit means coupled between emitters of said second and third transistors, an attenuated stereo composite signal being generated at collectors of said second and third transistors, respectively, and means for supplying said attenuated stereo composite signal to said left and right channel output terminals in order to obtain a high channel separation factor between left and right channels.

4,390,747
SPEECH ANALYZER

Tohru Sampei; Akihiro Asada; Yoshihiro Ohta, and Syunji Iwasaki, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1980, Ser. No. 191,294
Claims priority, application Japan, Sep. 28, 1979, 54-124055
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SC 3 Claims



1. A speech analyzer comprising:

(a) analog-to-digital converter means for receiving and sampling a natural speech signal;

(b) spectrum analyzer means responsive to an output signal of said analog-to-digital converter means for producing spectrum information of said natural speech signal and an output signal in which said spectrum information is eliminated from said natural speech signal;

(c) interpolator responsive to said output signal of said analog-to-digital converter means for interpolating intermediate values between adjacent samples and for producing an output signal representative thereof; and

(d) excitation source parameter analyzer means responsive to the output signal of said interpolator means for producing a pitch information signal indicating the pitch of said natural speech signal.

4,390,748

ELECTRO-ACOUSTICAL MEASURING DEVICE AND METHOD

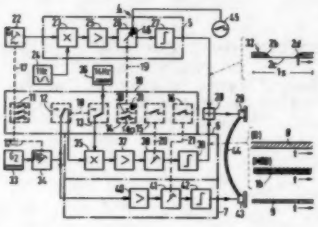
Eberhard Zwicker, Icking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,779

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951856

Int. Cl.³ A61B 5/12

U.S. Cl. 179—1 N **17 Claims**



1. An electro-acoustical device for use in determining the chronological resolution of hearing of an individual, said device comprising earphone means which may be applied to one ear of an individual being tested, a test tone channel connected with said earphone means for producing a test tone at the earphone means which can be interrupted, a masking sound channel which can be connected with the earphone means, and operable during testing of an individual for producing a masking sound for association with the test tone at said earphone means, adjustment means in said channels for adjusting the frequency of the test tone, and the level of the test tone and of masking sound, wherein the improvement comprises: said masking sound channel having noise generator means for generating the masking sound and for supplying noise bands matchable in terms of their frequency band to the adjusted frequency of the test tone, said adjustment means being operable for boosting the level of the masking sound in comparison to the quiescent hearing threshold level of the test tone, and a pulse modulator selectively operable in said masking sound channel for modulating the amplitude of said masking sound, while being switchable to an inactive condition to provide for the supply of a continuous unmodulated masking sound.

17. An electro-acoustical method for testing the chronological resolution of hearing, said method comprising:

in a first step supplying to an individual whose hearing is to be tested a test tone and determining the value of the threshold sound pressure level at which the individual is able to hear the test tone, so as to determine the quiescent hearing threshold level (RHS) of the individual for said test tone,

in a second step, supplying to the individual the same test tone masked by a continuous noise having a limited frequency band matched to the frequency of the test tone, and determining the sound pressure level at which the individual hears the test tone, so as to determine the listening threshold level (D) for said test tone when masked by said continuous noise,

in a third step supplying to the individual the same test tone masked by noise having said limited frequency band, but which noise is rectangularly amplitude modulated, and determining the sound pressure level at which the individual hears the test tone, so as to determine the listening threshold level (MOD) for said test tone when masked by said noise which is rectangularly amplitude modulated, and

carrying out said first, second and third steps such that chronological resolution of hearing can be judged from a diagram in which the determined threshold levels (RHS, D and MOD) are vertically plotted at equal horizontal distances from one another.

4,390,749

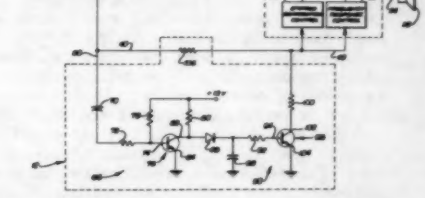
NOISE CONTROL SYSTEM FOR FM RADIO

Erik W. Pearson, Canoga Park, Calif., assignor to Superscope, Inc., Chatsworth, Calif.

Filed Apr. 13, 1981, Ser. No. 253,091

Int. Cl.³ H04H 5/00

U.S. Cl. 179—1 GJ **11 Claims**



1. In a radio receiver including means for receiving a broadcast FM stereo radio signal and for converting the signal to a stereo radio audio output, a noise control system, comprising:

noise reduction means responsive to the strength of the broadcast radio signal for reducing noise in the audio output when the signal strength is relatively low, said noise reduction means including means for generating a substantially dc voltage having a magnitude proportional to the strength of the broadcast radio signal and means responsive to said dc voltage for reducing noise in the audio output when the broadcast signal strength is relatively low;

detection means for detecting the presence of relatively high levels of noise substantially independent of signal strength, said detection means including a sensing circuit for sensing the presence of ac signal components indicative of noise superimposed upon said dc voltage and for generating an electrical signal when said sensed ac signal components exceed a predetermined threshold magnitude; and

control means responsive to detection of relatively high levels of noise by said detection means for controlling the operation of said noise reduction means to reduce noise in the audio output, said control means including means responsive to said electrical signal generated by said sensing circuit for coupling said dc voltage to a voltage divider circuit and for supplying a divided voltage of reduced magnitude to said means responsive to said dc voltage for reducing noise in the audio output.

4,390,750

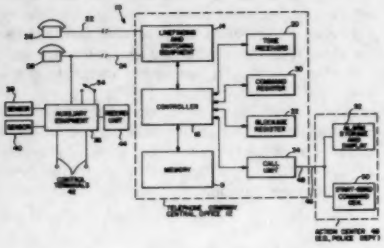
REMOTE SUPERVISORY SYSTEM

Everhard H. B. Bartelink, 15 Ridge Rd., Concord, N.H. 03301

Continuation of Ser. No. 926,102, Jul. 19, 1978, abandoned. This application Mar. 18, 1980, Ser. No. 131,444

Int. Cl.³ H04M *11/04*

U.S. Cl. 179—5 R **61 Claims**



26. Apparatus for supervising the condition of a telephone subscriber's premises by utilizing a telephone circuit that extends from the subscriber's premises to a telephone switching office of the type that includes linefinding means for identifying the subscriber whose telephone circuit is off-hook, and memory means for storing information including information concerning the identity of the subscriber, said apparatus comprising:

(A) sensing means at the premises for detecting the occurrence of a predetermined condition at the premises;

(B) responsive to the detection of said predetermined condition by said sensing means for creating a temporary off-hook condition on the telephone circuit, the subscriber whose telephone circuit is off-hook being identified by the line-identifying means in the office;

(C) means for transmitting a reporting signal to the office over the telephone circuit during the temporary off-hook condition, said reporting signal being indicative of the nature of said predetermined condition at the premises and being such that line switching equipment at the office does not respond to it; and

(D) means at the office for detecting and storing said reporting signal along with the subscriber identity in the memory means at the office.

4,390,751

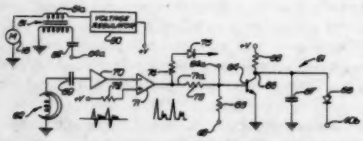
END OF REWIND DETECTION IN A TELEPHONE ANSWERING DEVICE HAVING REMOTE PLAYOUT

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Division of Ser. No. 111,589, Jan. 14, 1980, Pat. No. 4,315,104. This application Jan. 12, 1981, Ser. No. 224,042

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—6.07 **5 Claims**



1. A telephone answering device of the type having incoming message recording means, operative during automatic answering operation, to record an incoming message on a tape driven by a tape drive element, and having automatic playout means for playing out recorded incoming messages over the telephone line under remote control in response to detection of a coded signal, said device having the improvement comprising:

a cam mechanism including a cam and a cam drive motor for driving said cam, said tape drive element being positionable by said cam alternatively to a forward position in which said tape drive element drives said incoming message tape in a forward direction and to a rewind position in which said tape drive element rewinds said tape, said cam mechanism normally operating in response to receipt of said coded signal,

cam control circuit means, operative when power first is applied to said device, for determining if said cam is in a first orientation with said tape drive element in said forward position, and if not, for energizing said cam drive motor to drive said cam to said first orientation, said cam mechanism then being in readiness for normal operation in response to receipt of said coded signal, and

audio responsive circuit means, connected to the playback head associated with said incoming message tape, for monitoring the audio signal output from said playback head while said incoming message tape is being rewound and said tape drive element is in said rewind position, and for providing an end-of-rewind signal in response to the termination of said audio signal output, and

means for causing said motor to drive said cam into said first orientation in which said tape drive element is in said forward position in response to occurrence of said end-of-rewind signal.

4,390,752

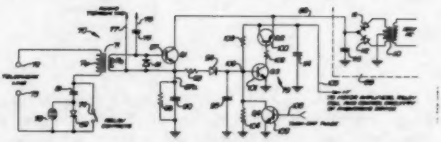
RING DETECTION CIRCUIT FOR A TELEPHONE ANSWERING DEVICE

Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406

Filed Nov. 28, 1980, Ser. No. 211,241

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—6.16 **2 Claims**



1. For use in a tape cassette or like telephone answering device in which metallic components that are electrically connected to the device electrical ground are accessible to the user, thereby requiring dc isolation of the telephone line from the device power source and electrical ground, a ring responsive circuit comprising:

a relay having a coil and a set of contacts,

an audio transformer having a primary and a secondary, the primary being connected in series with said relay contacts across the telephone line, said transformer being able to couple audio from the telephone line,

a neon bulb and circuit connected in parallel with said relay contacts so as to capacitively connect the transformer primary across the telephone line when said relay contacts are open, said neon bulb turning on for a portion of each cycle of the ring signal, conduction of said neon bulb resulting in the production of fast rise time transients having high frequency components which are effectively coupled by said transformer,

a source of power,

a transistor,

a first capacitor connected to be charged from said source of power via said transistor,

the secondary of said transformer being effectively connected to the base of said transistor so that the coupled high frequency components momentarily turn on said

transistor so as to cause concomitant charging of said first capacitor from said power source, and

bistable switching means, latched in response to the charging of said first capacitor, for connecting said source of power to electrical components of said telephone answering device, including said relay coil, the resultant closure of said relay contacts directly connecting said transformer primary to the telephone line to seize the same, audio thereafter being coupled between said telephone line and said answering device via said transformer.

4,390,753

LINE INTERRUPTION ARRANGEMENT

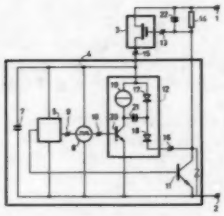
Daniël J. G. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,087

Claims priority, application Netherlands, Feb. 26, 1980, 8001135

Int. Cl.³ H04M *1/31*

U.S. Cl. 179—81 R **8 Claims**



1. A line interruption arrangement for producing electronically generated dial pulses in a telephone set comprising:

a first semiconductor switching element having a main current path and a control electrode, and

a control circuit having supply terminals and an output terminal, the main current path of said first semiconductor switching element being connected in series with the supply terminals of said control circuit between first and second line terminals, the output terminal of said control circuit being coupled to said control electrode of said semiconductor switching element for rendering the main current path of the semiconductor switching element conductive and non-conductive in response to the absence or presence of control pulses,

said control circuit further comprises an output circuit which makes the potential of the control electrode at least equal to the potential of said first line terminal which is directly connected to the main current path of said first semiconductor switching element.

4,390,754

TONE GENERATOR CIRCUIT

Douglas R. Holberg, Austin, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/00817, § 371 Date Jun. 30, 1980, § 102(e) Date Jun. 30, 1980, PCT Pub. No. WO82/00231, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 30, 1980, Ser. No. 265,983

Int. Cl.³ H04M *1/50*

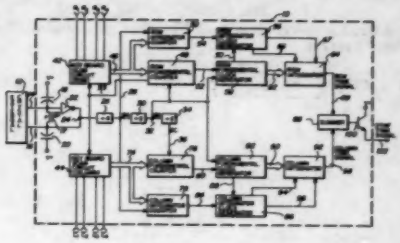
U.S. Cl. 179—84 VF **15 Claims**

1. A tone generator circuit for generating a selected frequency tone signal in response to an input signal, the tone generator circuit receiving a reference frequency signal higher in frequency than the selected frequency tone signal, the circuit comprising:

means for generating a fundamental rate signal derived from said reference signal and having a frequency determined by the input signal;

means for generating an integration rate signal derived from said reference signal and having a frequency determined by said input signal;

means coupled to said means for generating a fundamental rate signal and to said means for generating an integration rate signal for integrating a reference voltage to produce discrete voltage steps at the rate of said integration rate signal,



and also being responsive to said fundamental rate signal for selecting the polarity and amplitude of said discrete voltage steps to produce each cycle of said tone signal as a plurality of segments each segment comprising a plurality of similar integration steps.

4,390,755

DISTRIBUTION FRAME

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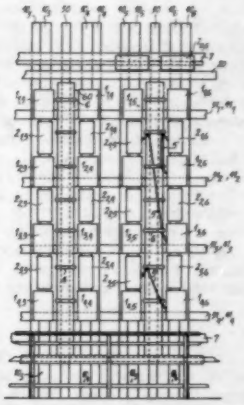
Filed Jun. 10, 1981, Ser. No. 272,373

Claims priority, application France, Jun. 18, 1980, 80 13483

Int. Cl.³ H04Q *1/14*

U.S. Cl. 179—98 **14 Claims**



1. A structure comprising:

first connecting means arranged in a first sub-matrix of columns and rows;

second connecting means arranged in a second sub-matrix of columns and rows, the second sub-matrix being coplanar with said first sub-matrix; and

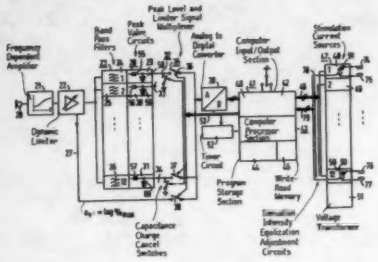
link cords for interconnecting terminals of one of said first connecting means to terminals of one of said second connecting means;

corresponding columns (resp. rows) of said two sub-matrices being aligned respectively and the rows (resp. columns) of said two sub-matrices being double interlaced.

4,390,756
METHOD AND APPARATUS FOR GENERATING ELECTROCUTANEOUS STIMULATION PATTERNS FOR THE TRANSMISSION OF ACOUSTIC INFORMATION

Christian Hoffmann; Manfred Zollner, both of Munich, and Eberhard Zwicker, Icking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 222,957
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003315
Int. Cl.³ H04R 25/00
U.S. Cl. 179—107 BC 23 Claims



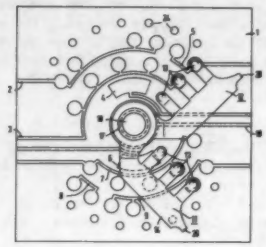
20. A method for producing electric stimulation patterns as a function of acoustical information, which patterns can be transmitted to the skin of an individual by means of electrodes and can be interpreted as acoustical information, said method comprising converting the acoustic signals into electrical signals, separating the electrical signals into frequency bands, and transmitting stimulating signals to respective electrodes based on the information in respective frequency bands, characterized in that electric signals from an acoustic to electric transducer are separated into component signals in band pass filters of frequency band widths (curve 54', FIG. 2) substantially corresponding to the frequency resolution capability of hearing (curve 54, FIG. 2), the latter component signals then being converted into signal levels corresponding to the component signal amplitudes, and, finally, taking into account the sensation intensity per electrode and following suppression of irrelevant components, the signal levels are converted into pulse durations of current pulses which are supplied to the electrodes, wherein the band widths of the filter channels with mean frequencies above 500 Hz are somewhat greater than third band widths (curve 54'', FIG. 2), and the band widths of filter channels with mean frequencies less than 500 Hz define a band width as a function of mean frequency which is relatively independent of the mean frequency and is approximated by a constant band width of approximately 130 Hz to 150 Hz.

4,390,757
CODING SWITCH

Edgar Wiessner, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,415
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040546
Int. Cl.³ H01H 19/14
U.S. Cl. 200—11 G 11 Claims

1. A coding switch comprising at least two conductor paths each having a plurality of contact points disposed about at least a portion of a circle, circles about at least a portion of which the contact points of the respective conductor paths are disposed being coaxial, and an elongated wiper rotatably secured at one end thereof at the center of the coaxial circles and extending radially therefrom, the wiper having at least two electrically connected contact points spaced along said wiper so as to be radially spaced with respect to the coaxial circles, the wiper having a handle disposed at an end thereof radially spaced from said one end by means of which the wiper can be rotated about the center of the coaxial circles so that each



contact point of the wiper can come into electrical contact with the contact points of a respective conductor path as the wiper is rotated.

4,390,758
KEY-ACTUATED ELECTRICAL LOCK

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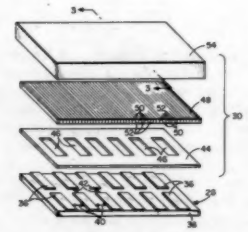
Filed Jan. 16, 1981, Ser. No. 225,752
Int. Cl.³ H01H 27/10, 27/00
U.S. Cl. 200—43 4 Claims



1. A key-actuated locking device comprising:
a key having a handle, a flat longitudinal main body attached to the handle, a row of closely spaced apart teeth at a distal end of the main body defining a predetermined pattern from among a plurality of possible different patterns, and orientation means carried by the main body for defining a predetermined orientation of the row of teeth;
a longitudinal key passageway into which the key is inserted, the key passageway cooperating with the orientation means so that the row of teeth have the predetermined orientation;
a circuit board positioned in a first plane adjacent and perpendicular to an end of the key passageway and having a plurality of pairs of separated conductors thereon defining a row of closely spaced apart locations corresponding to possible positions of the spaced apart teeth of the key for a plurality of possible different patterns, including the predetermined pattern;
an insulator sheet positioned adjacent to the circuit board and between the circuit board and the key passageway, the insulator sheet having a plurality of openings, each opening aligned with at least one of the closely spaced locations defined by the separated conductors;
a plurality of elastomeric conductors positioned between the key passageway and the insulator sheet, at least one elastomeric conductor being aligned with each closely spaced location defined by the pairs of separated conductors,

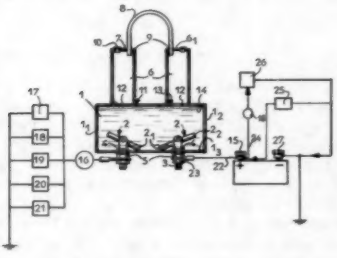
each elastomeric conductor having a first surface for receiving force supplied by a tooth of the key and a second surface for engaging and electrically connecting the pair of separated conductors with which it is aligned, so that when force is applied to the first surface of the elastomeric conductor, its second surface is brought into engagement and electrical contact with the pair of separated conductors with which it is aligned, and wherein the elastomeric conductor is resilient and compressible so that application of force by the tooth which is greater than needed to bring the second surface into engagement with the pair of separated conductors causes compression of the elastomeric conductor without damage to the circuit board, the pair of separated conductors, or the key; and

means connected to the conductors and actuated when only the pairs of conductors at locations corresponding to the predetermined pattern are connected by the elastomeric conductors.

4,390,759
TILT-SENSITIVE IGNITION SWITCH

Roger Scieur, Etoges, 51270 Montmort Lucy, France

Filed Apr. 17, 1981, Ser. No. 255,040
Claims priority, application France, May 21, 1980, 80 11307
Int. Cl.³ H01H *35/02*
U.S. Cl. 200—52 A **4 Claims**



1. An automotive ignition cutoff device for preventing a fire or explosion by interrupting at least a portion of the electrical system of a vehicle in the event of overturning or tipping of the vehicle, and comprising:

an elongate hollow body;

at least two conductive studs extending through a wall of said body and sealingly attached thereto, and electrodes attached individually and respectively to each of said studs, said electrodes disposed within said body in a spaced apart relation and said studs connected within said electrical system to provide an electrical circuit discontinuity between one terminal of a battery and a remaining portion of said electrical system;

an electrically conductive fluid disposed within said body and means for electrically connecting said electrodes by said fluid and completing said circuit according to an orientation of said vehicle within a tilt threshold and for electrically disconnecting said electrodes and interrupting said circuit according to an orientation of said vehicle beyond said tilt threshold;

tubes connected to said body, each of said tubes having an axis generally perpendicular to an axis of said body and communicating on one end with an interior of said body via a calibrated orifice generally opposite of said body axis from said respective electrode, said tubes communicating with each other on another end via an air transfer tube; and

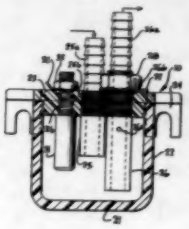
an air pervious plug in each of said tubes, said plugs providing means for preventing compression and depression within said device;

whereby air is allowed to pass through said plugs and fluid is not allowed to pass therethrough so that, upon turning said device upside down, said fluid may flow smoothly according to the calibration of said orifices.

4,390,760
CONDUCTIVITY TYPE IN-LINE LIQUID SENSING APPARATUS

Stephen W. Schwitters, Rockford, Ill., assignor to Taylor Freezer Company, Rockton, Ill.

Filed Jan. 18, 1982, Ser. No. 340,352
Int. Cl.³ H01H *29/00*
U.S. Cl. 200—61.04 **6 Claims**



1. A conductivity type in-line liquid sensing apparatus for insertion in a liquid supply line to sense interruption of the liquid supply in the line, the sensing apparatus comprising a container having an inlet and an outlet adapted for connection in a liquid supply line in series therewith to have the liquid from the line pass through the container, the container being formed of an electrically insulative material and defining a closed trap chamber having a top and bottom, the liquid outlet including an outlet tube electrode of electrically conductive material extending downwardly in the chamber and terminating with its lower end at a preselected level below the top and above the bottom of the chamber, a second electrode extending downwardly in the chamber and terminating with its lower end at a level above the lower end of the outlet tube electrode, a gas vent opening in the outlet tube electrode at a level above the lower end of the second electrode and below the top of the chamber, the gas vent opening having a size that is small as compared to the internal size of the outlet tube electrode and operative to pass gaseous fluids therethrough from the chamber to one outlet while substantially impeding flow of liquid therethrough to the outlet, and electrical conductivity sensing means connected to said outlet tube electrode and said second electrode for sensing the conductivity therebetween.

4,390,761
HIGH CURRENT SWITCHING

Angelo J. Introvigne, Stafford Springs, Conn., assignor to Cole Hersee Company, South Boston, Mass.

Filed Jan. 19, 1981, Ser. No. 226,079
Int. Cl.³ H01H *21/00*
U.S. Cl. 200—67 C **7 Claims**

1. Switching apparatus comprising,

first and second insulatedly separated blade contact means of conducting material,

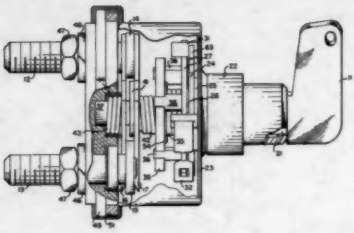
third blade contact means of conducting material relatively rotatable with respect to an axis about which said first and second blade contact means are located in fixed relationship,

means for relatively angularly displacing said third blade contact means relative to said first and second contact blade means about said axis in a plane perpendicular to said axis and parallel to the planes of all said blade contact means to selectively interconnect said first and second blade contact means with said third blade contact means

with said blade contact means upon interconnection being in dovetailing relationship,

action spring means having first and second ends and surrounding said axis for selectively storing and releasing mechanical rotating energy for selectively displacing said third blade contact means with snap action only upon release of the stored energy,

key shaft means for providing torque for winding said action spring means to store potential energy therein by rotating one of said first and second ends about said axis while the other remains stationary about said axis,



means including cam means concentric about said axis rotated by said key shaft means and latch spring means responsive to said key shaft means being displaced a predetermined angle about said axis to actuate said latch spring means with said cam means for releasing the potential energy stored in said action spring means by releasing the previously stationary one of said first and second ends while the previously rotating one remains stationary,

and means for coupling the torque provided by said action spring means upon releasing said potential energy to said third blade contact means for angularly displacing the latter.

4,390,762

CONTACT PIECE FOR AN ELECTRIC VACUUM SWITCH

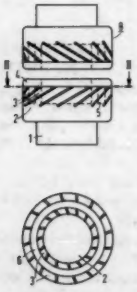
Franz Watzke, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,157

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009925

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **5 Claims**



1. Contact piece for an electric vacuum switch, comprising a contact carrier base, an obliquely slotted contact carrier wall having an upper surface and being integral with said base forming a pot-shaped contact carrier together with said base, said pot-shaped contact carrier being substantially formed of copper and having a circular cross-section, an unslotted substantially planar contact ring being formed of a contact material and being disposed in said upper surface of said wall, said wall having a circular groove with a rectangular cross-section formed therein extended downwardly from said upper surface thereof, and another unslotted ring formed of a material having a greater resistance than copper being disposed in said groove.

4,390,763

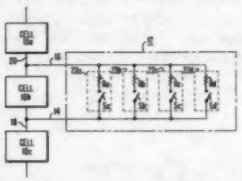
ELECTROCHEMICAL CELL SHUNTING SWITCH ASSEMBLY WITH MATRIX ARRAY OF SWITCH MODULES

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1981, Ser. No. 267,823

Int. Cl.³ H01H *33/00*; C25B *9/04*

U.S. Cl. 200—144 B **5 Claims**



1. An electrochemical cell shunting switch assembly which is connectable to the terminals of adjacent series connected electrochemical cells to provide an efficient high current capacity shunt path around the shunted cell, and to permit diversion of the shunt current back through the shunted cell in a predetermined time dependent manner, wherein the shunting switch assembly comprises:

(a) first and second bus connectors, the first bus connector connectable at one end to a terminal of a cell adjacent to the cell to be shunted, and the second bus connector connectable at one end to a terminal of another cell adjacent to the cell to be shunted, with the other ends of the first and second bus connectors being disposed in spaced apart parallel planes;

(b) a matrix array of a plurality of parallel switch modules connectable between the first and second bus connectors, which matrix array includes a plurality of shunt path switch modules and a plurality of current diversion switch modules, each of which shunt path switch modules comprise a switch means having contacts which are relatively reciprocable to open and close the switch contacts, with one switch contact serially connected to selected low resistance means to one of the bus connectors, and the other switch contact is connected by flexible connection means to the other bus connector, with individual operating means connected to the switch contact connected to the flexible connector means for opening and closing the switch contacts, which low resistance means is selected to provide a high efficiency shunt current path; and

(c) each of which current diversion modules comprises a switch means and operating means as described above and a selected high resistance means is serially connected to one switch contact and to one of the bus connectors, which high resistance means is selected such that when the shunt path modules are opened a selected portion of the shunt current is diverted back through the shunted cell, and with sequential opening of individual current diversion modules to increase the diverted current back through the cell until with the opening of the last current diversion module all of the current has been diverted back through the previously shunted cell.

4,390,764

PUFFER-TYPE GAS BLAST SWITCH

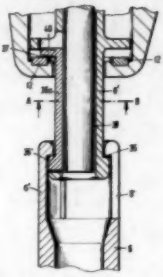
Karl Kriechbaum, Kassel; Hans-Georg Augustin, Fuldabrück, and Dietrich Hoffmann, Kassel-Ki, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,403

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918145; Jan. 26, 1980, 3002803

Int. Cl.³ H01N 33/88

U.S. Cl. 200—148 A 26 Claims



1. A puffer-type gas blast switch comprising a gas compression device composed of two components constituting, respectively, a piston and a cylinder between which is defined a gas compression chamber, one of the components being stationary and the other one of the components being movable for compressing a quenching gas in the chamber during switch opening, an insulating nozzle mounted for directing the compressing quenching gas from the chamber against a switching arc, a first power contact fixed to the movable component of the gas compression device and movable between a switch closing position and a switch opening position, a second power contact arranged to be conductively connected to the first power contact when the latter is in its switch closing position and movable with the latter during at least the initial portion of its movement from the switch closing position, stationary means supporting said second contact, spring means urging the second contact in a direction to break its connection with the first contact, said second contact being directly and releasably connected to said first contact when said first contact is in its switch closing position, and abutment means for limiting the path of movement of said second contact with said first contact during movement of said first contact to its switch opening position.

4,390,765

RUBBER-MADE COVERING MEMBER FOR PUSH BUTTON SWITCHES

Ryoichi Sado, Saitama; Yoshitsugu Morikawa; Takekuni Okamoto, both of Tokyo, and Kazutoki Tahara, Ageo, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,662

Claims priority, application Japan, Jun. 9, 1980, 55-77434

Int. Cl.³ H01H 13/52

U.S. Cl. 200—159 B 4 Claims

1. A push button switch covering member integrally shaped of a rubbery elastomeric material which comprises

(a) a central pushing part having a downwardly facing protrusion,

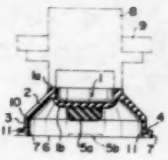
(b) a first annular portion encircling and connected to the central pushing part, which is susceptible to a snapping action by the buckling deformation when the central pushing part is depressed by pushing,

(c) a second annular portion encircling and connected to the first annular portion, and

(d) a base flat surrounding and connected to the second annular portion, at which the push button switch covering member is mounted on a base board of the switch with said protrusion facing said base board, said base flat including a fixed contact lying below said protrusion, the second annular portion having a cylindrical configuration connected at one end to the first annular portion and to the base flat at the other end and being capable of being deformed, when the central pushing part is depressed by pushing, in such a manner that the diameter of the circular connecting line between the first and second annular portions is increased before the first annular portion undergoes a buckling deformation.

2. A push button switch covering member integrally shaped of a rubbery elastomeric material which comprises

(a) a central pushing part having a downwardly facing contact,



(b) a first annular portion encircling and connected to the central pushing part, which is susceptible to a snapping action by a buckling deformation when the central pushing part is depressed by pushing,

(c) a second annular portion encircling and connected to the first annular portion, and

(d) a base flat surrounding and connected to the second annular portion, at which the push button switch covering member is mounted on a base board of the switch with said protrusion facing said base board, said base flat having a fixed contact thereon for engagement with said downwardly facing contact, the second annular portion having a flat annular configuration parallel to the base flat as connected to the first annular portion at the inner periphery and connected to the base flat at the outer periphery and capable of being bent toward the base board around the connecting line between the second annular portion and the base flat when the central pushing part is depressed by pushing before the first annular portion undergoes a buckling deformation.

4,390,766

APPARATUS AND METHOD FOR CONTROLLING ELECTRONIC CONTROLLED COOKING APPARATUS HAVING STORAGE

Atsushi Horinouchi, Otsu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Feb. 20, 1980, Ser. No. 123,021

Claims priority, application Japan, Feb. 28, 1979, 54-23802

Int. Cl.³ H05B 1/02, 9/06

U.S. Cl. 219—10.55 B 20 Claims

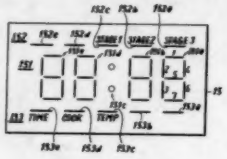
16. A method for controlling stages of storage means in an electronic controlled cooking apparatus, said cooking apparatus comprising

entry means for entering data concerning a cooking condition with respect to a material being cooked, said entry means having at least one cooking condition key for selecting a plurality of cooking conditions, numeral keys, and a specified function key,

storage means for storing said cooking condition data entered from said entry means, said storage means having a plurality of successively defined stages including an initial,

final and at least one intermediate stage, said successive stages being cyclically defined so that said initial stage successively follows said final stage, each said stage having a plurality of regions for storing a group of cooking mode data concerning at least one cooking condition,

buffer memory means for temporarily storing cooking mode data corresponding to one of said stages as it is being entered from said entry means, and having buffer storage regions of the number corresponding to at least the number of said plurality of regions in said one of said stages of said storage means, at least one of said buffer storage regions being used as a flag region identifying which one of said plurality of stages of said storage means will be used to store the data which is presently being stored in said buffer memory means, said method comprising the steps of:



detecting said flag regions of said buffer memory means, corresponding to said plurality of stages of said storage means, responsive to manual operation of said specified function key,

transferring said cooking mode data temporarily stored in said buffer memory means into the corresponding one of said stages of said storage means responsive to said detection of said flag regions,

transferring the cooking mode data in the stage which successively follows said stage corresponding to said set flag to said buffer memory means, and

changing the flag setting in said flag regions of said buffer memory means to the flag corresponding to said following stage.

4,390,767

WINDOWED AND CHOKED COMBINATION OVEN DOOR

Arnold M. Bucksbaum, Cedar Rapids, and Buddy J. Austin, Atkins, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 28, 1981, Ser. No. 229,060
Int. Cl.³ H05B *6/76*
U.S. Cl. 219—10.55 D **10 Claims**

1. A windowed door for a microwave oven, comprising:

an inner metal panel having a first side facing the cavity of said oven and a second side facing away from said cavity as defined with said door closed, said panel having an aperture for providing a window in said door;

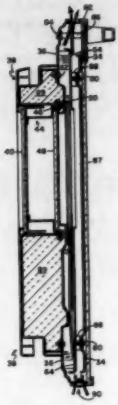
a metal plate positioned on said second side of said panel, said plate being aligned with said aperture and spaced from said panel defining a passageway from said cavity through said aperture and around said plate;

said plate having a plurality of perforations for viewing said cavity;

a first choke-coupling microwave seal communicating with a peripheral region of said plate for preventing the escape of microwave energy from said cavity along said passageway;

a microwave and light transparent glass pane seated between said metal plate and said second side of said panel, said pane covering said aperture; and

a second choke-coupling microwave seal positioned at the perimeter of said metal panel for suppressing leakage of



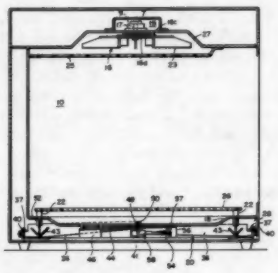
microwave energy from said cavity through the gap between the access opening and said perimeter.

4,390,768

COOK-BY-WEIGHT MICROWAVE OVEN

Wesley W. Teich, Wayland, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 190,285, Sep. 24, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,720
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **4 Claims**



1. A microwave oven comprising:

an outer housing;

a conductive cavity within said housing, said cavity having a substantially rectangular floor;

a chamber in said housing below said floor;

a weight sensing device positioned in said chamber;

said floor having four apertures respectively located in regions adjacent to the four corners, said apertures having a perimeter of less than one-half wavelength of said microwave energy;

four microwave transparent vertical columns supported by said weight sensing device and respectively protruding through said four apertures in said floor into said cavity;

a plate positioned in said cavity and supported by said four columns whereby the weight of an object placed on said plate is coupled to said weight sensing device;

said weight sensing device providing a first signal which is a function of the weight supported by said columns;

a microprocessor;

a control panel having operator selectable means for providing a second signal corresponding to the initial temperature of said object;

a magnetron for supplying microwave energy to said cavity; and

said microprocessor controlling said magnetron in response to said first and second signals.

4,390,769

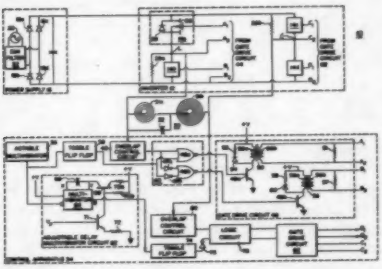
INDUCTION HEATING APPARATUS PROVIDING SMOOTH POWER CONTROL

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 29, 1980, Ser. No. 154,222

Int. Cl.³ H05B 3/04

U.S. Cl. 219—10.77 **8 Claims**



1. An improved induction heating apparatus providing smooth power control comprising:

a direct current power supply;

a full bridge inverter having first and second legs, each inverter leg comprised of first and second gate turn-on switching means serially coupled across the output of said direct current power supply, each of said first and second gate turn-off switching means of each inverter leg comprising a field transistor and a diode coupled in the reverse power supply voltage direction across the drain-to-source portion of said field effect transistor;

a resonant induction drive coil load circuit coupled between the junctions of the switching means of said first and second inverter legs, respectively; and

a control apparatus coupled to each of said switching means of said first and second inverter legs for rendering said first and second switching means of each said inverter leg conductive at alternate intervals, said control apparatus controllably delaying initiation of alternate conduction of the switching means of said second inverter leg after initiation of alternate conduction of the switching means of said first inverter leg in accordance with the magnitude of an operator-varied voltage, thereby permitting smooth variation of inverter output power between 0 to 100 percent of maximum output power, said control apparatus comprising an astable multivibrator clock means for generating an output signal at uniform periodic intervals, first circuit means having a first input coupled to the junction between switching means of said first inverter leg and having a second input coupled to said clock means, said first circuit means coupled at its first and second outputs to a separate one of said first and second switching means of said first inverter leg, respectively, and alternately rendering one of said first and second switching means of said first inverter leg conductive in response to said clock means output signal, said first circuit means comprising a toggle flip-flop having an input coupled to said clock means and producing an output voltage which alternately changes in amplitude between a first and second level in response to said clock means output clock signal, an overlap control circuit having an input coupled to the junction between switching devices of said first inverter leg and producing an output voltage which changes in amplitude from a first to a second level in response to the voltage at its input, a logic circuit coupled at its first input to said toggle flip-flop and coupled at its second input to said overlap control circuit, said logic circuit producing a first output voltage whose amplitude changes from a first to a second level in accordance with a first predetermined relationship between voltages at it first and second inputs and producing a second output voltage whose amplitude changes from a first to a second level in accordance with a second predetermined relationship between voltages at its first and second input and gate drive circuit means coupled at its first and second input to said logic circuit means and coupled at each of its first and second output to a separate one of said first and second switching means, respectively, of said first inverter leg, said gate drive circuit supply said first and second switching means with gate drive voltage in accordance with the amplitude of a separate one of said logic circuit first and second output voltages, respectively, delay circuit means having an input coupled to said clock means, said delay circuit means generating an output signal after an interval following receipt of said clock means output signal, said interval being variable in duration in accordance with said operator-varied voltage, and second circuit means having a first input coupled to the junction between switching means of said second inverter leg and having a second input coupled to said delay circuit means, said second circuit means coupled at its first and second outputs to a separate one of said first and second switching means of said second inverter leg, respectively, and alternately rendering one of said first and second switching means of said second inverter leg conductive in response to said delay circuit means output signal.

4,390,770

AUTOMATIC WELDING APPARATUS FOR SOLAR CELLS

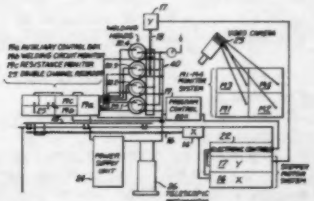
Franz Köhler, Unterhaching, and Albert Meggl, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 65,444, Aug. 10, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,390

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841465

Int. Cl.³ B23K 11/10

U.S. Cl. 219—56.21 **8 Claims**



1. Automatic welding apparatus for welding contact tabs to solar cells which are particularly adapted for use in space vehicular solar generators comprising:

a plurality of welding electrodes including electrode heads having individually controlled contact pressure means;

a solar cell conveying table movable in a given direction for

moving solar cells through a welding station past said welding electrodes;

said electrode heads being arranged to extend across said conveying table;

means for moving said electrode heads in a first and a second direction perpendicular to each other, said first and second directions both being perpendicular to said given direction of movement of said conveying table;

means for controlling said conveying table to effect automatic positioning of welding points on said solar cells beneath said welding electrodes;

high-powered current supply means for enabling control of welding current supplied to said electrode heads;

protective gas line means feeding each of said electrode heads;

ohmmeter means for monitoring the effective contact resistance at each of said welding points;

means for enabling individual visual inspection of welds produced by each of said electrode heads; and

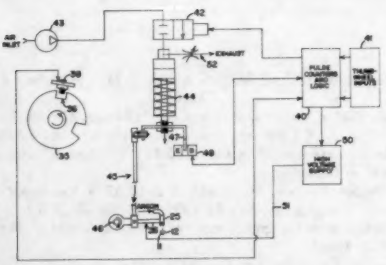
program control means for monitoring operational parameters of said apparatus for effecting management of operational functions thereof.

4,390,771

BONDING WIRE BALL FORMING METHOD AND APPARATUS

John A. Kurtz, Gorham, and Donald E. Cousens, Saco, both of Me., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 11, 1981, Ser. No. 262,595
Int. Cl.³ B23K *11/22*
U.S. Cl. 219—56.22 **37 Claims**



1. A method for forming a ball by melting the end of bonding lead wire extending from a capillary wire holding tool for ball bonding of the lead wire to a die pad of an integrated circuit chip or other microelectronic substrate surface comprising;

substantially enclosing the end of the bonding wire in a shroud or shield;

flooding the shroud or shield and the end of the bonding wire with an inert gas;

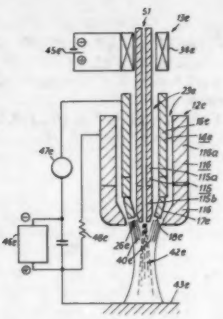
generating a controlled pulse train of a preset count of electrical pulses for establishing arc discharge between the wire and the shroud or shield thereby controlling and metering the energy delivered for melting and forming a ball of uniform quality at the end of the wire; and maintaining the pulse height and therefore the voltage amplitude of said pulses substantially constant by establishing said voltage across relatively large high voltage capacitance and discharging no more than substantially 10% of the charge stored by said capacitance for generating said pulses.

4,390,772

PLASMA TORCH AND A METHOD OF PRODUCING A PLASMA

Susumu Hiratake, 1662-9 Kizuki-cho, Kasugai-shi, Aichi-ken, Japan

Division of Ser. No. 22,651, Mar. 21, 1979, Pat. No. 4,275,287.
This application Nov. 24, 1980, Ser. No. 209,624
Claims priority, application Japan, Sep. 28, 1978, 53-119575
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PQ **2 Claims**



1. A method of obtaining a plasma of active gas in a plasma torch comprising the steps of:

(a) providing a pair of radially-spaced coaxial annular nozzle elements each having a convergent frusto-conical surface at a discharge end thereof,

(b) providing an annular cathode disposed coaxially between said convergent surfaces,

(c) providing a bore along the axis of said nozzle elements and said cathode,

(d) discharging an arc from said cathode,

(e) discharging a gas outwardly from said discharge ends of said nozzles to cause said arc to converge,

(f) developing a magnetic field across said discharge ends for causing said arc discharged from said cathode to rotate to accomplish emission of said arc uniformly from the entire perimeter of said cathode thereby to cause said plasma jet to issue as a convergent funnel-shaped flow, and

(g) introducing active gas through said axial bore into said convergent funnel-shaped flow at a position spaced axially from said discharge openings where said funnel-shaped flow has become narrowed, thereby to transform said active gas into a plasma.

4,390,773

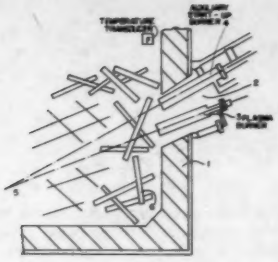
CONTACT ELECTRODE FOR MELTING AND HEATING FURNACES WITH DC PLASMA HEATING

Fred Esser, Wettiner Str. 9, DDR-7010 Leipzig; Detlev Klöpper, E.-Schubert-Str. 20, DDR-7024 Leipzig; Walter Lachner, Schlüterstr. 20, DDR-8021 Dresden, and Gerhard Scharf, Lotzestr. 4, DDR-8027 Dresden, all of German Democratic Rep.

Filed Feb. 5, 1981, Ser. No. 231,606
Int. Cl.³ H05H *1/00*; B23K *1/00*
U.S. Cl. 219—121 PR **1 Claim**

1. In a metallurgical plasma melting furnace for the melting of metals and alloys, having at least one plasma burner having a longitudinal axis mounted in a furnace sidewall port, the improvement comprising at least one start-up burner having a longitudinal axis for each of said at least one plasma burners, the start-up burner mounted in the same port as its associated

plasma burner and alongside same with said longitudinal axes of the start-up burner and associated plasma burner intersecting within the furnace and forming an acute angle at the point of intersection.

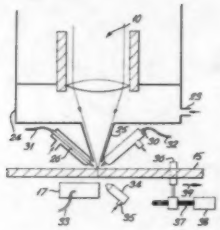


4,390,774

METHOD AND APPARATUS FOR TREATING ELECTRICALLY NON-CONDUCTIVE WORKPIECES

William M. Steen, New Maldon, England, and Walter W. Duley, King City, Canada, assignors to National Research Development Corporation, London, England

Filed Mar. 24, 1981, Ser. No. 247,112
Claims priority, application United Kingdom, Mar. 25, 1980, 8009981
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 FS 22 Claims



1. A method for treating a workpiece comprising
projecting a beam of light from a laser onto a workpiece formed from non-conductive material and
applying a voltage between at least two electrodes, each distinct from said workpiece to strike an arc,
the electrodes being so positioned that the arc impinges on the workpiece within a heat affected zone created by the laser beam in the workpiece.

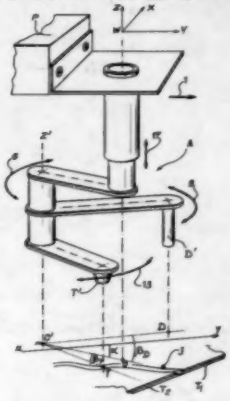
4,390,775

AUTOMATIC AND SELF-ADAPTING PROCESS FOR FUSION-WELDING A JOINT BETWEEN TWO SURFACES

Dominique Biava, Clamart; Jean Cornu, Nantes; Jean-Marie Detriche, Chambourcy; Richard Galera, Meylan; Bernard Tiret, Verdun, and Paul Marchal, Gif sur Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 13, 1981, Ser. No. 234,362
Claims priority, application France, Feb. 13, 1980, 80 03152
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 17 Claims

1. Automatic, self-adapting process for welding a joint by fusion with the aid of a welding head which comprises a joint detector and a torch and which is supported by a holder mobile along the joint, this welding head being mobile in rotation about a main axis related to the holder and substantially perpendicular to the plane tangential to the surfaces to be welded at the location of the joint and being mobile in translation along this main axis, the torch and the detector being mobile in rotation about a secondary axis related to the head and parallel to the main axis, the torch passing through the main axis in the course of rotation about the secondary axis, the detector being in advance with respect to the torch, during the displacement of the holder, a reference direction being defined for all the degrees of freedom of the head when the above-mentioned axes as well as the axes of the torch and the detector are in the same plane; said process comprises the following steps of:
recording, during a trial operation prior to welding, the successive positions of the holder along the joint,
determining for each of these positions in the course of this



operation the direction of a straight reference line defined by the two points of intersection of the axis of the torch and of the axis of the detector with the outline of the joint on the surfaces of the pieces to be assembled and recording an electric voltage corresponding to the angular position of this reference direction;
measuring, in the course of welding and for each position of the holder, the angle of the detector with respect to the reference direction of the head, when the detector is above the joint;
correcting, in the course of welding following the trial operation, the angular position of the torch when the torch occupies the position previously occupied by the detector, by an angular displacement which is a funtion of the angular deviation of the detector with respect to the corresponding reference direction at this point of the joint and of the speed of displacement of the head on its path.

4,390,776

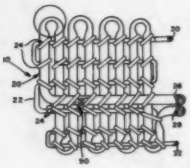
IMMERSION HEATER

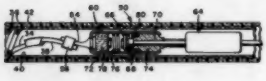
Daryl J. Yane, 2735 Pioneer Trail, Aurora, Ohio 44202, and Roger A. Yane, 954 Canyon View Rd., Sagamore Hills, Ohio 44067

Filed Mar. 1, 1982, Ser. No. 353,601
Int. Cl.³ H05B 3/06
U.S. Cl. 219—523 8 Claims

1. A continuous, flexible heating cable assembly array for immersion heating of a liquid in a container, said cable array comprising:
(a) a heating element disposed in coiled pitches of substantially uniform diameter having a length substantially greater than the coil diameter, said element being formed of a continuous bare wire having a high electrical resistance;

(b) a flexible braided sheath of fibrous glass material received over said coiled pitches continuously along the length thereof;
(c) said coil heating element having at least one uncoiled region disposed intermediate the ends thereof and intermediate to regions of said coiled pitches, which region has the element disposed in axially substantially linear arrangement for a predetermined interval of length;
(d) an outer tubular casing formed of flexible, electrical insulating material having a low surface coefficient of friction and a high resistance to heat and attacks by acid and alkaline solutions, said casing being received over said sheath element and continuous along the length thereof;
(e) connecting means attached to each end of said coiled element and disposed within said casing;





(f) power lead means attached to each of said connecting means, said lead means extending beyond the respective adjacent end of said casing, said lead means being adapted for connection to a source of electrical power;
(g) said cable assembly being folded or bent at a radius less than twice the diameter of said casing in said uncoiled region without materially disturbing said coiled pitches wherein said cable assembly has a plurality of said uncoiled regions spaced therealong and forms an array of side-by-side closely spaced, unbent sections disposed in generally serpentine arrangement;
(h) support means; and,
(i) means for attaching the individual sections to said support means for maintaining said side-by-side closely spaced serpentine arrangement.

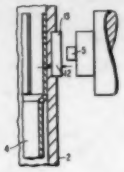
4,390,777

FUSION WELDING PROCESS

Kenneth C. Thomas, Export; Eric D. Jones, Salem, and Marvin A. McBride, Hempfield Township, Westmoreland County, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 19, 1981, Ser. No. 245,487
Int. Cl.³ B23K *9/23*
U.S. Cl. 219—127 **1 Claim**

1. In a method of fusion welding an austenite metal member to the inside surface of an elongated austenite metal duct by securing the metal member against the inside surface of the duct wall and by applying fusion welding means to the outside surface of the duct wall, the improvement comprising forming a hole from the outside surface partway through the wall of the duct in alignment opposite the metal member secured therein, affixing a metal pellet containing ferrite of sufficient nickel and chromium equivalence to form on fusion with the austenite metal member and duct an alloy including about 5–10% ferrite; and



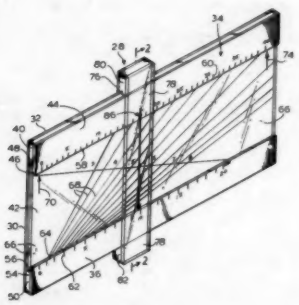
fusing the austenite metal duct wall, austenite metal member and pellet together through application of fusion welding means outside said duct to form said weld including ferrite alloy.

4,390,778

CALCULATOR FOR DETERMINING OPTIMUM TONE REPRODUCTION

Thomas N. Toivonen, 173-03 Fairchild Ave., Flushing, N.Y. 11358

Filed Oct. 7, 1981, Ser. No. 309,488
Int. Cl.³ G06C *3/00*
U.S. Cl. 235—89 R **16 Claims**



1. A mid-tone calculator for determining optimum tone reproduction to maximize color reproduction comprising; a base having a longitudinal guideway therein and an original density scale and a density compression scale thereon, a lower slide reciprocally shiftable in the guideway, an upper transparent slide reciprocally shiftable in the guideway and overlying the lower slide and the upper and lower slides being shiftable in the guideway with respect to one another, one of the upper and lower slides having a high density indicator and the other of the upper and lower slides having a low density indicator, one of the upper and lower slides having a plurality of tone reference number of curves and the other of the upper and lower slides having a tone intersect line, a transparent cursor longitudinally shiftably mounted on the base, overlying the upper and lower slides and shiftable with respect thereto, and having a half tone placement indicator thereon, and the base, lower slide, upper slide, and cursor being sequentially shiftable with respect to one another so that shifting of the upper and lower slides to produce alignment of the high density indicator with a predetermined high density reading and the low density indicator with a predetermined low density reading on the original density scale will cause the tone intersect line to intersect the tone reference number curves and thereafter shifting of the cursor to a chosen point of intersection of the tone intersect line with a tone reference curve will bring the half tone placement indicator into alignment with a reading on the

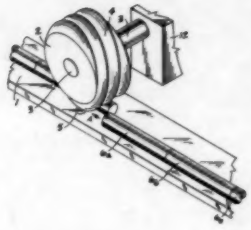
density compression scale to indicate a density for optimum half tone position.

4,390,779

METHOD AND APPARATUS FOR DETECTING ARTICLES MOVING IN A CONTINUOUS STREAM

Rodney W. Heikel, Mocksville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 23, 1980, Ser. No. 162,272
Int. Cl.³ G06M *7/04, 7/08*
U.S. Cl. 377—6 **5 Claims**



2. Apparatus for counting articles fed in a continuous stream, comprising:

means for detecting the presence or absence of articles in a detection zone and generating signals responsive to same;

means for conveying successive lead articles in a direction of travel into said detection zone so that said detecting means detects the presence of said lead article;

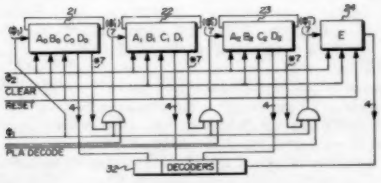
means for accelerating said lead article transversely to said direction of travel while retaining said lead article oriented substantially parallel to said direction of travel such that said acceleration commences after said detecting means detects the presence of said lead article, said acceleration being effective to cause the rearmost portion of said lead article to describe a path of motion entirely outside said detection zone.

4,390,780

LSI TIMING CIRCUIT FOR A DIGITAL DISPLAY EMPLOYING A MODULO EIGHT COUNTER

Ta-Ming Wu, and Gregory E. Gaertner, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 10, 1980, Ser. No. 205,801
Int. Cl.³ G06F *3/14;* H03K *1/17, 21/36;* H04N *5/06*
U.S. Cl. 377—44 **10 Claims**



1. In a timing circuit for a digital display, a counter means comprising:

a plurality of counter stages connected in series;

each counter stage having four cells connected in series such that each counter stage will provide a drive signal to the next counter stage in the series only when the driving counter stage has progressed from zero to seven; and

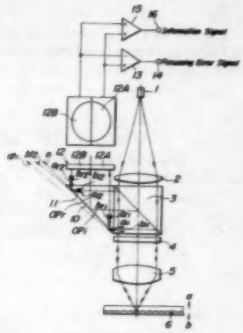
cell decoding circuitry coupled to the outputs of each cell of each counter stage such that only two cell readouts are required to decode the state of each counter stage.

4,390,781

METHOD AND APPARATUS FOR DETECTING FOCUSSING ERROR SIGNAL OF OBJECTIVE LENS

Toru Musha, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Japan

Continuation-in-part of Ser. No. 161,428, Jun. 20, 1980, abandoned. This application Oct. 8, 1980, Ser. No. 195,075
Claims priority, application Japan, Jun. 25, 1979, 54-79943
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **36 Claims**



1. A method for detecting a focussing error signal of an objective lens with respect to an object onto which a light spot is to be formed by means of said objective lens, comprising

focussing light emitted from a light source onto the object;

introducing at least a part of a light flux reflected from the object into an optical member including an optical surface which reflects and/or refracts said part of the light flux, said optical member being made of material which has a higher refractive index than that of the material into which said light flux enters after being refracted by and transmitted through said optical surface, said optical surface being set so that a given light ray in said part of the light flux is made incident upon the optical surface at an angle which is substantially equal to a given critical angle when said objective lens is in an in-focussed condition; and

detecting a variation in distribution of light amount of at least a part of the light flux reflected and/or refracted by said optical surface to produce a focussing error signal.

4,390,782

METHOD AND APPARATUS FOR MEASURING THE LIQUID LEVEL OF CONTAINERS

Karl-Ulrich Vornfett, Hamburg, Fed. Rep. of Germany, assignor to Justus Technik GmbH Industrie-Anlagen, Hamburg, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,615
Int. Cl.³ G01N *21/24*
U.S. Cl. 250—223 B **9 Claims**

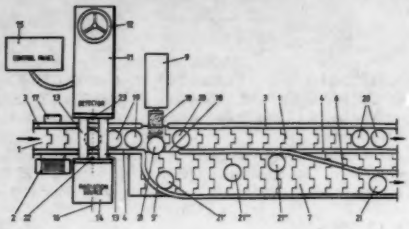
1. A method for measuring the liquid level in each of a number of containers comprising:

moving said container on a conveyor belt one at a time past a measuring station having a radiation source and detector;

detecting the speed of movement of said belt and producing a speed signal indicating that speed;

passing radiation through each said container as said con-

tainer passes through said station for a given number of time periods of fixed duration; and



varying the time between said periods in accordance with said speed signal so that each container recreives substantially the same radiation regardless of its speed.

4,390,783

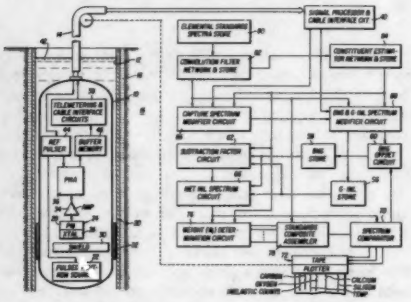
SPECTROSCOPIC ANALYSIS WITH BACKGROUND COMPENSATION

James A. Grau, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 174,969, Aug. 4, 1980. This application Oct. 2, 1981, Ser. No. 307,930

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—270 **20 Claims**



1. A method for spectroscopically analyzing the elemental constituents of a geological formation, the method comprising the steps of:

(a) repetitively irradiating the formation with bursts of primary radiation;

(b) for each burst, detecting secondary radiation emanating from the formation during a first time interval;

(c) generating a gross energy spectrum from a series of said first time intervals, said gross energy spectrum including a portion due to background;

(d) for each burst, detecting secondary radiation emanating from the formation during a different, second time interval;

(e) generating a background spectrum from a series of said second time intervals;

(f) adjusting said background spectrum to more closely resemble the background portion of said gross energy spectrum by repetitively changing the offset of said background spectrum by different amounts and selecting the changed background spectrum which most closely resemb'es the background portion of said gross energy spectrum; and

(g) substantially eliminating said background portion of said gross energy spectrum by combining said gross energy spectrum and said adjusted background spectrum to generate an improved net energy spectrum substantially free of background.

4,390,784

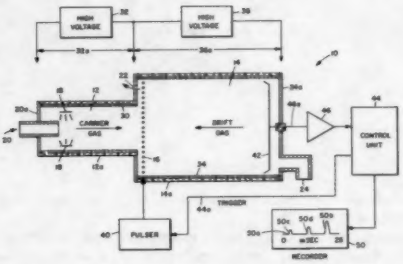
ONE PIECE ION ACCELERATOR FOR ION MOBILITY DETECTOR CELLS

David R. Browning, Reisterstown; Gordon R. Sims, Jr., Joppa; John C. Schmidt, and David W. Sickenberger, both of Baltimore, all of Md., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 80,887, Oct. 1, 1979, abandoned. This application Jan. 29, 1981, Ser. No. 229,480

Int. Cl.³ H01J *49/40*

U.S. Cl. 250—287 **8 Claims**



1. In an ion mobility detector having an ion mobility grid and an enclosed volume in which an electrostatic field operates on ions for characterizing the mobility of said ions in said electrostatic field in an environment of gas and vapor molecules whose mean free path is many times smaller than the boundaries of said ion mobility detector, an improvement wherein the electrostatic field is enclosed within a relatively continuous structure comprised of first and second tubes communicating with each other through said ion mobility grid, said first tube encompassing a reactant region and said second tube encompassing a drift region, said relatively continuous structure having a film resistor disposed on the surface of said structure encompassing said field whereby a voltage potential difference impressed across said film resistor causes said field to be generated.

4,390,785

METHOD AND APPARATUS FOR REMOTELY DETECTING GASES IN THE ATMOSPHERE

Mark E. Faulhaber, and James M. Prober, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 29, 1980, Ser. No. 220,997

Int. Cl.³ H01J *31/49*; G01J *1/00*

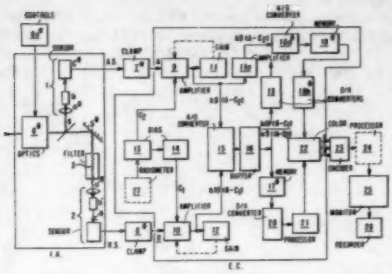
U.S. Cl. 250—330 **24 Claims**

1. A method of detecting the presence in the atmosphere of a gas which absorbs or emits infrared radiation within a defined wavelength region and determining its location with respect to at least one fixed background reference point, wherein

(a) a number of points within a circumscribed background area, which are at a temperature different from the average temperature of the intervening atmosphere are viewed by the imaging optics of an imaging-analyzing means having a first sensor means and a second sensor means capable of generating electrical output signals that are responsive to the resulting net radiative flux transmitted through the atmosphere;

the first sensor means having a higher sensitivity and the second sensor means having a lower sensitivity to the gas of interest in the defined infrared wavelength region;

(b) the amplitudes of the output signals generated by said sensor means are ratioed pixel-by-pixel within the defined infrared wavelength region; and



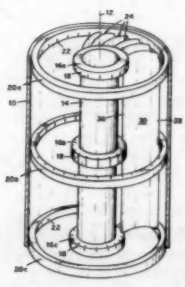
(c) an image signal responsive to the ratio of said output signal amplitudes is produced, said image signal being displayed on a display means, the image indicating the presence of the gas of interest at at least one point within the circumscribed area being surveyed.

4,390,786

NEUTRON DETECTION APPARATUS

Manfred K. Kopp, Oak Ridge, and Kenneth H. Valentine, Lenoir City, both of Tenn., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,031
Int. Cl.³ G01T *1/18*
U.S. Cl. 250—385 **13 Claims**



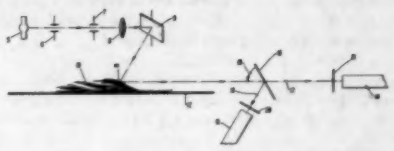
1. An array of electrode plates uniformly spaced apart from one another about an axis, each of said electrode plates having a spiral-arc configuration in a plane perpendicular to said axis, inner edges of said electrode plates being parallel with and spaced equidistant from said axis and said electrode plates spiralling in the same direction relative to said axis with the spacing between adjacent ones of said electrode plates remaining constant as the distance between the side surfaces thereof and said axis increases.

4,390,787

METHOD AND APPARATUS FOR AUTOMATIC EGG MASS COUNTING

Daniel T. Jennings, Orono, Me.; Charles K. Carniglia, Santa Rosa, Calif., and David B. Young, Indiana Harbour Beach, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 29, 1980, Ser. No. 202,032
Int. Cl.³ G01N *21/33*
U.S. Cl. 250—459.1 **13 Claims**



1. A method for counting biological masses on foliage samples comprising the steps of:

exposing a foliage sample having attached biological masses to ultraviolet radiation in a test chamber, causing said foliage sample and masses to fluoresce;

dividing the fluoresced from the exposed biological masses and foliage into blue and green component colors and individually measuring each color;

discriminating between the fluoresced light due to the biological masses and the fluoresced light from other foliage components; and

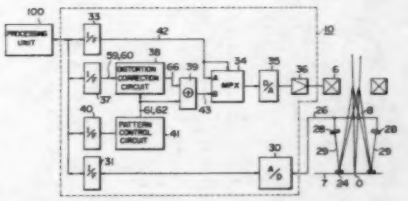
counting the biological masses based upon the fluoresced light of said component colors emitted from the masses.

4,390,788

ELECTRON BEAM PATTERNING METHOD AND APPARATUS WITH CORRECTION OF DEFLECTION DISTORTION

Soichiro Hayashi, and Yoshihiko Sacnaga, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,512
Claims priority, application Japan, Mar. 5, 1980, 55-26699
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—491.1 **6 Claims**



1. An apparatus for forming a predetermined pattern on an object through controlled deflection of an electron beam while correcting the deflection distortion of the electron beam, said apparatus comprising:

deflector means for deflecting an electron beam;

an object provided with a plurality of reference marks formed thereon for correcting a deflection distortion associated with said deflector means;

a processing unit which is operative before pattern formation to measure the positions of the reference marks on said object by scanning the reference marks with the electron beam to determine deflection distortion correction data through interpolation on the basis of the measured results and which provides pattern forming data; and

a control unit which preliminarily stores said correction data

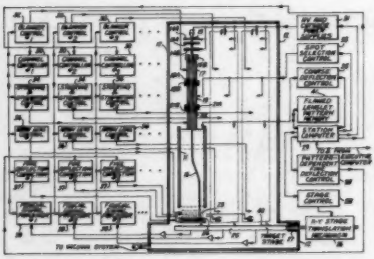
and is operative upon pattern formation to correct said pattern forming data supplied from said processing unit by use of the stored correction data, thereby supplying the corrected data as a deflection signal to said deflector means, including A/D converter means for converting information obtained by scanning said reference marks with said electron beam into digital signals and for supplying said digital signals to said processing unit, a signal change-over switch responsive to a control signal from said processing unit, D/A converter means for D/A converting the output of said switch to produce a deflection signal to be supplied to said deflector means, correction means for producing a correction signal for actual pattern formation on the basis of said correction data from said processing unit, pattern control means for producing a deflection signal to be supplied to said deflector means on the basis of said pattern forming data from said processing unit, and adder means for adding said correction signal from said correction means and said deflection signal from said pattern control means to produce a corrected deflection signal, said signal change-over switch being responsive to said control signal to select the output from said adder means upon pattern formation and the output data from said processing unit upon correction of deflection distortion.

4,390,789

ELECTRON BEAM ARRAY LITHOGRAPHY SYSTEM EMPLOYING MULTIPLE PARALLEL ARRAY OPTICS CHANNELS AND METHOD OF OPERATION

Donald O. Smith, Lexington, and Kenneth J. Harte, Carlisle, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 21, 1981, Ser. No. 266,074
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—492.2 **60 Claims**



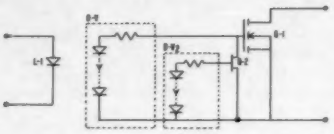
1. A multi-channel electron beam array lithography (EBAL) apparatus employing a plurality of parallel operated electron beam channels each being of the fly's eye type having an electron gun for producing an electron beam, an array lenslet assembly and associated fine deflector assembly together with a coarse deflector for selectively directing the electron beam to a desired array lenslet within the array lenslet assembly and its associated fine deflector which thereafter directs the electron beam to a desired point on a target surface, a common movable stage for supporting target surfaces below the plurality of parallel operated electron beam channels and for moving the target surfaces in common relative to the array optics assembly of all channels, and a common vacuum enclosure housing enclosing all of said electron beam channels within a commonly evacuated space.

4,390,790

SOLID STATE OPTICALLY COUPLED ELECTRICAL POWER SWITCH

Edward T. Rodriguez, Winchester, Mass., assignor to Theta-J Corporation, Mass.

Continuation-in-part of Ser. No. 65,072, Aug. 9, 1979, Pat. No. 4,296,331. This application Sep. 12, 1980, Ser. No. 186,419
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **5 Claims**



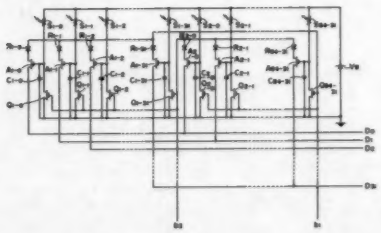
1. A solid state optically-coupled relay comprising,
(a) solid state light emitting means,
(b) principal solid state photodector means comprising a first diode series array optically controllable by the light emitting means,
(c) output terminal means,
(d) an enhancement-mode vertical conduction (DMOS) MOSFET, constituting an output FET of the relay switch with gate, source and drain electrodes, the source and drain electrodes thereof being connected to said output terminal means and the source and gate electrodes being connected directly to the ends of the first diode array.

4,390,791

SOLID-STATE PHOTOELECTRIC TRANSDUCER

Katsunori Hatanaka, Yokohama; Shunichi Uzawa; Yutaka Hirai, both of Tokyo, and Naoki Ayata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,752
Claims priority, application Japan, Mar. 31, 1980, 55-42207; Mar. 31, 1980, 55-42208; Mar. 31, 1980, 55-42209; Mar. 31, 1980, 55-42210
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—578 **58 Claims**



36. A solid-state photoelectric transducer comprising a plurality of output units for photoelectrically converted signals, each unit including:
a plurality of photoelectric converter elements;
a plurality of signal amplifying means for outputting amplified signals corresponding to signals output from said photoelectric converter elements corresponding to an amount of light incident on said photoelectric converter elements, each of said signal amplifying means being connected with a corresponding one of said photoelectric converter elements;
a plurality of cross-talk preventing means for preventing cross-talk of signals output from each of said signal amplifying means, each of said signal amplifying means being

provided with one of said cross-talk preventing means; and

compensation means for compensating the environmental characteristics of the photoelectric converter elements in the output unit;

a plurality of said signal amplifying means being exclusively selected by a unit selecting signal in each of said output units, and said signal amplifying means of the same level in each of said output units having a signal output line in common.

4,390,792

AUTOMOTIVE ELECTRICAL POWER SUPPLY SYSTEM WITH REVERSE POLARITY INDICATION

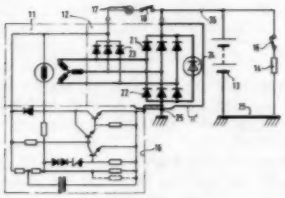
Friedhelm Meyer, Illingen; Wolfgang Kurz, Hemmingen, and Joachim Severing, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,238

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030700

Int. Cl.³ H02J 7/00

U.S. Cl. 307—10 BP **7 Claims**



1. A self-contained power supply system having an alternator (11);

a battery (13) separable and separately connectable and replaceable in the system, and having terminals of predetermined polarity;

a rectifier (12) including an array of rectifier diodes (21, 22);

cooling plates (33, 34) retaining said rectifier diodes;

an insulating support plate (28), said cooling plates with the rectifier diodes thereon being secured to the insulating suppot plate; and

output terminals (25, 26) of said predetermined polarity, the rectifier being connected to the alternator to rectify the output therefrom and supply current to the battery to charge the battery, and

means to indicate connection of the battery (13) to the rectifier with reverse polarity including

a diode (24) connected across the output terminals (25, 26) and poled in blocking direction with respect to the polarity of the output terminals, said diode having a current capacity small with respect to that of the rectifier and being secured to the insulating plate (28) and electrically connected between the respective cooling plates (33, 34) of the rectifier.

4,390,793

ELECTRONIC LIQUID LEVEL CONTROL APPARATUS

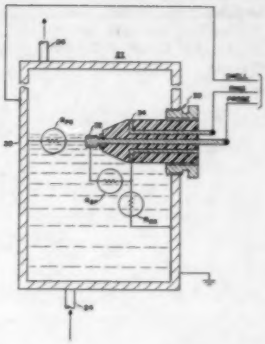
Robert S. John, Deerfield, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 236,842

Int. Cl.³ G05D 9/12; H01H 35/18

U.S. Cl. 307—118 **7 Claims**

1. An apparatus for monitoring the level of liquid in a container in which the container comprising a conductive member in contact with any liquid in the container, a probe assembly mounted in said container to contact liquid at least reaching a predetermined level in the container; said probe assembly includes a liquid level sensing probe member positioned to be contacted by liquid in the container reaching said predetermined level, and a guard shield spaced from said probe member and insulated electrically therefrom, said shield and said probe member being insulated electrically from said container conductive member, a source of alternating current, the invention comprising a voltage divider across said source of current and including in said divider resistance of liquid between the container conductive member and the probe member, a sensing circuit path in parallel with the liquid resistance, said parallel path including the liquid and surface leakage between the conductive member, the probe member and the guard shield



for monitoring circuit leakage from said members to said guard shield, an circuit coupled to said voltage divider and biased to respond to voltage conditions in said divider sensed between said probe member and said conductive member during alternate half cycles of the current from the source to produce a monitoring output indicative of liquid reaching said level, a leakage monitoring circuit coupled to said probe member and biased to monitor circuit leakage conditions during the intervening half cycles of the current from the source for interrupting the output circuit responsive to excessive surface leakage conditions monitored during said intervening half cycles.

4,390,794

CIRCUIT ARRANGEMENT FOR CONTROLLING THE SWITCH-ON OF SUPPLY VOLTAGE

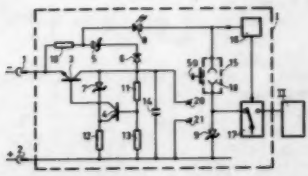
Wilhelmus G. Kuiper, and Anne Klaassen, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,528

Claims priority, application Netherlands, Jan. 28, 1981, 8100388

Int. Cl.³ H01H 9/54

U.S. Cl. 307—140 **3 Claims**



1. A circuit arrangement for controlling the switch-on of a supply voltage in an electrical apparatus which has first and second supply terminals, the series arrangement of the emitter-base path of a first transistor and the collector-emitter path of a second transistor being arranged between the first and second

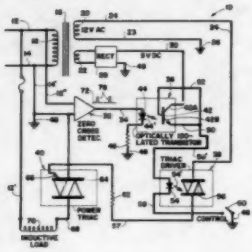
supply terminals, the base of the second transistor being connected to a voltage divider provided between the collector of the first transistor and the second supply terminal, characterized in that a second series arrangement of a resistor, a photodiode, a Zener diode and a switching element is arranged between the first and second supply terminals, the collector of the first transistor being connected to a point on the second series arrangement via at least a diode.

4,390,795

A.C. POWER CONTROL FOR INDUCTIVE LOADS

Reginald B. Tharrington, Broken Arrow, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed May 26, 1981, Ser. No. 266,804
Int. Cl.³ G05F 1/64; H02P 13/24
U.S. Cl. 307—143 **2 Claims**



1. An electronic switching system for inductive loads in A.C. circuits, comprising;

(a) triac switch means in series with an inductive load across an A.C. voltage and gate means for controlling ignition in said triac switch means;

(b) triac driver means with photo electric control for igniting said triac driver means, the output of which controls the potential on said gate means of said triac switch means;

(c) optically isolated transistor means for controlling the light emitting diode in said triac driver means; and

(d) zero crossing detecting means for supplying short term voltage pulses to control the light emitting diode of said optically isolated transistor means;

whereby, responsive to said zero crossing detecting means, said triac driver means enables said triac switch means which conducts in the reverse direction as soon as the prior current in the forward direction drops to zero, which is at a variable time after voltage zero, dependent on the power factor of the load.

4,390,796

VOLTAGE TO DUTY CYCLE CONVERTER

Robert W. McClenahan, Philadelphia, and Thomas J. Walsh, Hatboro, both of Pa., assignors to Leeds & Northrup Co., North Wales, Pa.

Filed Apr. 15, 1981, Ser. No. 254,797
Int. Cl.³ H03K 5/00; H03L 7/00
U.S. Cl. 307—261 **8 Claims**

1. A converter for converting an analog voltage to a duty cycle comprising:

a capacitor

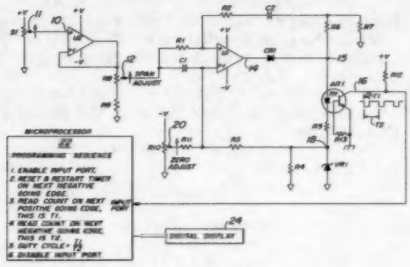
a resistor connected at one terminal to said capacitor to form a series circuit;

a differential amplifier;

a reference voltage source provided by a zener diode supplied by current from the output of said differential amplifier;

switching means including a series connected diode and resistor in circuit connecting said zener diode to the output of said differential amplifier so that outputs of one polarity cause a fixed voltage to be maintained across said zener diode with outputs of opposite polarity being disconnected from said zener diode by said diode, said switching means being operative to selectively pass charging current through said series circuit from said reference voltage source in one state and for disconnecting said source to discharge said capacitor through said resistor in another state; and

detecting means including said differential amplifier whose inverting input is connected to said terminal and whose non-inverting input is connected to receive both said analog voltage through an input resistor and a positive



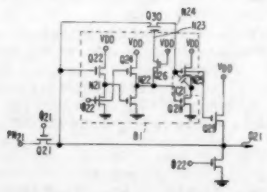
feedback signal from the output of said amplifier by way of a series resistance-capacitance network connecting said output to said non-inverting input, said detecting means being responsive solely to the difference between said analog voltage and the voltage at said terminal for causing said switching means to go from said one state to said other when said difference reaches a certain magnitude of one polarity and to reverse states when said difference reaches said magnitude in an opposite polarity, whereby the duty cycle of the resulting oscillations is proportional to the value of said analog voltage.

4,390,797

SEMICONDUCTOR CIRCUIT

Shoji Ishimoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,806
Claims priority, application Japan, Aug. 7, 1979, 54/100893
Int. Cl.³ H03K 5/01
U.S. Cl. 307—264 **9 Claims**



1. A semiconductor circuit comprising a first node, a second node, first means for supplying said first node with a logic signal, a first field effect transistor coupled between said first and second nodes, means for operatively making said first transistor conducting thereby to provide said second node with a signal at said first node, a power supply terminal, a second field effect transistor, means for connecting one of a source and a drain of said second transistor to said power supply terminal, means for connecting the other of the source and drain of said second transistor to said second node, a delay

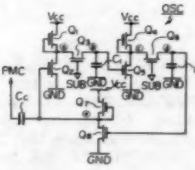
circuit having an input terminal coupled to said second node, a true output terminal and a complement output terminal, a third field effect transistor, means for connecting one of a source and a drain of said third transistor to said second node, means for connecting a gate of said third transistor to said complement output terminal, means for connecting the other of the source and drain of said third transistor to a gate of said second transistor, a capacitor, means for connecting one end of said capacitor to the gate of said second transistor and means for connecting the other end of said capacitor to said true output terminal.

4,390,798

BIAS-VOLTAGE GENERATOR

Setsuo Kurafuji, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 19, 1980, Ser. No. 208,384
Claims priority, application Japan, Nov. 22, 1979, 54/151777
Int. Cl.³ H03K *3/01, 3/353*
U.S. Cl. 307—296 R **5 Claims**



1. A bias-voltage generator for applying a bias voltage to a semiconductor substrate having an integrated circuit thereon, said generator comprising:

an oscillator producing an oscillating AC signal, said oscillator comprising an RC circuit for varying the frequency of said oscillating AC signal in response to variations of the voltage level of said semiconductor substrate, said RC circuit including a capacitor (C) and a variable resistance (R) comprising a MOSFET having a gate electrode directly connected to the semiconductor substrate such that said variable resistance varies in accordance with the variations of the voltage level of the semiconductor substraie;

a coupling capacitor connected, at one end thereof, to the output of said oscillator; and

a charge pumping circuit for absorbing electric charges accumulated in said semiconductor substrate, connected firstly to the other end of said coupling capacitor, secondly to a ground of said integrated circuit, and thirdly to said semiconductor substrate,

wherein the oscillating frequency of said oscillating AC signal produced by said oscillator varies in proportion to the variation of the voltage level of said semiconductor substrate.

4,390,799

TEMPERATURE COMPENSATED SWITCHABLE CURRENT SOURCE

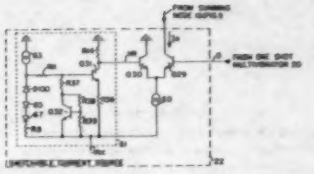
James C. Schmoock, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 922,397, Jul. 5, 1978, Pat. No. 4,234,806. This application Jun. 13, 1980, Ser. No. 159,314
Int. Cl.³ H03K *5/153, 17/14*
U.S. Cl. 307—310 **3 Claims**

1. A temperature compensated switchable current source comprising:

(a) means for producing a pulsed signal which changes from a first level to a second level in a time interval, such time interval varying with temperature over a predetermined range of temperatures;

(b) means, including a pair of transistors coupled to a current source, a first one of such transistors having a base electrode adapted for coupling to the pulsed signal producing means and a second one of such transistors having a base electrode fed by a reference voltage, for enabling current from the current source to pass through one of the pair of transistors when the level of the pulsed signal is at the first level, such first level being greater than the reference voltage and for enabling current from the current source to pass through the other one of the transistors when the level of the pulsed signal is at the second level, such second level being less than the reference voltage;



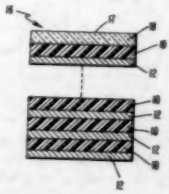
(c) means for producing the reference voltage and for varying the level of such reference voltage with variations in temperature such variation in the level of such reference voltage being in accordance with the variation in the time interval of the pulsed signal changing from the first level to the second level, enabling a pulse of current to pass from the current source through one of the pair of transistors in response to the pulsed signal, such current pulse having a time duration substantially invariant with variations in temperature over the predetermined range of temperatures.

4,390,800

ELECTRET DEVICE

Masamichi Tanaka, Yamato, and Hiroto Wada, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 30, 1981, Ser. No. 280,052
Claims priority, application Japan, Jun. 30, 1980, 55-88780; Jun. 30, 1980, 55-88782; Jun. 30, 1980, 55-88816
Int. Cl.³ G11C *13/02*
U.S. Cl. 307—400 **4 Claims**



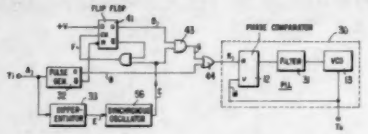
1. An electret device comprising:

a plurality of electret elements formed in stacked layers upon each other, wherein at least the electret element located at the bottom layer comprises a polarized dielectric body situated adjacent to the electret element in the succeeding layer and a conductive electrode secured to the bottom surface of said dielectric body, each electret element having a volume of surface charge of a single polarity, and a cover body constructed of a conductive material attached to the top surface of the electret element located at the top layer of said stack.

4,390,801
CIRCUIT FOR REPRODUCING A CLOCK SIGNAL

Hirotaka Kurata, Kokubunji, and Shiro Yoshida, Machida, both of Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,233
Claims priority, application Japan, Jun. 8, 1981, 56-87942
Int. Cl.³ H03K 5/13, 17/28
U.S. Cl. 307—409 9 Claims

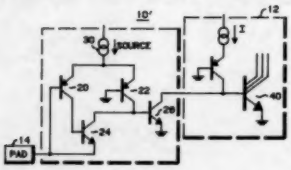


1. A circuit for reproducing a clock signal comprising
a phase lock loop circuit having a voltage-controlled oscillator that generates an oscillation output at a frequency which is approximately equal to an integral multiple of the frequency of the clock signal contained in an input signal,
a pulse-generating device that outputs pulses of a fixed width triggered by said input signal and synchronous therewith, the output pulses of said pulse-generating device being supplied as an input to said phase lock loop circuit,
an oscillation device that outputs pulses having approximately the same period as the clock signal period triggered by the input signal, and
a selecting device to gate the output pulse of the said oscillation device to said phase lock loop circuit as an input in the output pulse spacing of the said pulse-generating device, the output pulse spacing of the said pulse-generating device being interpolated with the output pulse of the said oscillation device so that a clock signal output is obtained from the said phase lock loop circuit.

4,390,802
LOW-VOLTAGE, HIGH-NOISE IMMUNITY I²L INTERFACE

Stephen H. Woltz, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1980, Ser. No. 219,084
Int. Cl.³ H03K 19/091, 19/092
U.S. Cl. 307—475 4 Claims

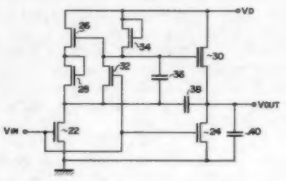


1. An improved integrated injection logic (I^2L) interface adapted for switching associated I^2L logic circuitry by selective grounding of an associated bonding pad, including in combination:
first and second transistors forming a differential pair, each transistor being of a first conductivity type and having base emitter and collector electrodes;
a constant current source for providing an injector current to said emitter electrodes of said differential transistor pair;
third and fourth transistors of a second conductivity type and having base emitter and collector electrodes; and
means for connecting said base of said first transistor and said emitter of said third transistor to the associated bonding pad, for connecting said collector electrode of said first transistor to said base electrode of said third transistor, for interconnecting said collector electrode of said third transistor to said collector electrode of said second transistor and to said base electrode of said fourth transistor, and for connecting and permanently maintaining said base electrode of said second transistor and said emitter electrode of said fourth transistor at ground reference potential,
said collector electrode of said fourth transistor being connected to the associated I^2L logic circuitry for control thereof.

4,390,803
SEMICONDUCTOR DRIVER CIRCUIT

Hideharu Koike, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 19, 1980, Ser. No. 218,094
Claims priority, application Japan, Dec. 27, 1979, 54/171656
Int. Cl.³ H03K 17/687, 3/01
U.S. Cl. 307—578 6 Claims



1. A semiconductor driver circuit comprising:
an input terminal;
a power supply terminal;
a first switching MOS transistor having a gate connected to said input terminal;
a second switching MOS transistor having a gate connected to said input terminal, a load capacitor being adapted to be connected in parallel with a current path of said second switching MOS transistor;
a series circuit of first and second MOS transistors connected between said power supply terminal and said first switching MOS transistor;
a third MOS transistor connected between said power supply terminal and said second switching MOS transistor;
a third switching MOS transistor whose current path is connected at one end to a junction between said first switching MOS transistor and said series circuit of first and second MOS transistors, and at the other end to the gates of said second and third MOS transistors, and whose gate is connected to said input terminal;
a series circuit of first and second capacitive means connected between the gate and source of said third MOS transistor, a junction between said first and second capacitive means being coupled with a junction between said first and third switching MOS transistors; and
a fourth MOS transistor whose source is to be connected with said load capacitor through said first and second capacitive means and whose gate and drain are connected with said power supply terminal.

4,390,804

MAGNETO GENERATOR FOR IGNITION SYSTEMS

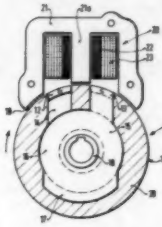
Josef Orova, Schwabach; Herbert Roderer; Hans D. Schmid, both of Nuremberg, and Horst-G. Steffen, Schwarzenbruck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,517

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023677

Int. Cl.³ F02P *1/00*; H02K *25/12*

U.S. Cl. 310—70 R **8 Claims**



1. Magneto generator for an ignition system comprising

a rotating magnet wheel (**10**);

a plate shaped permanent magnet (**16, 31**) embedded in said magnet wheel, said permanent magnet having a first and second pole face at opposite axial sides thereof;

a first and second pole plate (**14, 15; 32, 33**) respectively abutting said first and second pole face and located at respective first and second axial positions of said magnet wheel, each of said first and second pole plate having a radially extending portion and an axially extending claw shaped pole shoe (**12, 13; 34, 35**) located at the periphery of the wheel,

said pole shoes being located circumferentially adjacent each other, projecting axially across said permanent magnet and spanning a minor portion of the circumference of said magnet wheel; and

at least one of said pole plates having a weight compensating extension (**17, 37**) in the region of the magnet wheel radially opposite said pole shoes.

4,390,805

ELECTROMECHANICAL MACHINE

James H. Hahn, Fort Lauderdale, Fla., assignor to David H. Rush, Hollywood, Fla.

Continuation of Ser. No. 22,422, Mar. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 816,610, Jul. 18, 1977, Pat. No. 4,118,556. This application Dec. 24, 1981, Ser. No. 334,303

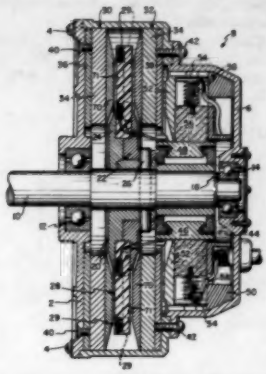
Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **21 Claims**

1. An electromechanical machine comprising:

first and second stator members spaced apart to form a gap therebetween, each having a circular array of P magnetic poles of alternately opposite polarity, P being an even integer, each pole of each stator member occupying a substantially equal pole arc sector of the circular array and being aligned opposite an opposite-polarity pole of the other stator member,

an armature rotor between the stator members having a non-overlapping, circular array of C coils on each of the front and back face thereof, C being an integer greater than P, the coil array on one rotor face being angularly offset relative to the coil array on the other rotor face, each coil of each rotor



face occupying a substantially equal coil arc sector smaller than a pole arc sector; and

a commutator rotatable with the rotor.

4,390,806

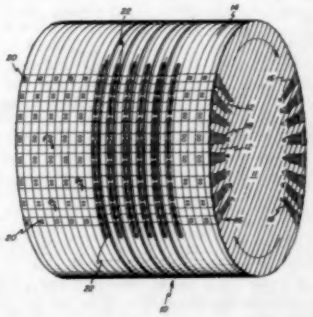
DYNAMOELECTRIC MACHINE ROTORS WITH MECHANICAL SEPARATORS

Kirk G. O'Brien, Schenectady, and John A. DeBrita, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,574

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—261 **8 Claims**



1. A rotor for a dynamoelectric machine comprising:

a cylindrical core of magnetically permeable material having longitudinal slots along the outer periphery thereof:

a plurality of series-connected conductive windings disposed in layers within said longitudinal slots, said layers being maintained in series connection by electrical insulation disposed between said layers in which at least one of said layers comprises at least two parallel-connected laminations; and

an abrasion prevention material disposed between said parallel-connected laminations and having a thickness and composition unrelated to the electrical conductivity between said laminations and said abrasion prevention material is effective to prevent galling between said laminations in the event of relative motion therebetween.

4,390,807

SURFACE ACOUSTIC WAVE DEVICE

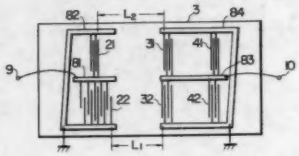
Kiyoharu Kishimoto, Yokohama; Katashi Hazama, Zushi, and Akitsuna Yuhara, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 90,436, Nov. 1, 1979, abandoned. This application Jan. 7, 1982, Ser. No. 337,718

Claims priority, application Japan, Nov. 1, 1978, 53-133699; Nov. 1, 1978, 53-133700

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 B 18 Claims



1. A surface acoustic wave device having constant-frequency-interval multi-peak frequency characteristics where the frequency interval between adjacent peak frequencies is Δf, the device comprising:

a piezoelectric substrate;

first, second and third electrodes formed on said substrate in spaced relation to each other, each of said three electrodes having a passband not narrower than said frequency interval Δf;

signal source means coupled to one of said three electrodes to effect a first conversion with one electrode to convert an electric signal generated by said signal source means into a surface acoustic wave signal which is propagated along said substrate by said one electrode;

means for electrically connecting the other two electrodes to each other in a polarity reversed sense; and

detector means coupled to said other two electrodes to effect a second conversion with said other two electrodes to convert the surface acoustic wave signal propagated by said one electrode and received by said other two electrodes into an electric signal through said detector means,

wherein said three electrodes are spaced apart from one another on said substrate so that the difference between the distance between said first and second electrodes and the distance between said first and third electrodes is equal to v/Δf, where v represents the speed of a surface acoustic wave propagating along the surface of said substrate, so that peak frequencies defined by $(n+\frac{1}{4})\Delta f$ (n=0, 1, 2, —) are obtained from said surface acoustic wave device.

4,390,808

PICTURE DISPLAY DEVICE HAVING A GAS DISCHARGE DISPLAY PANEL

Gerhard H. F. De Vries, and Harmanus B. Bulle, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

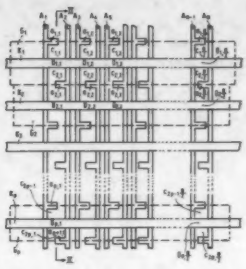
Filed Oct. 6, 1980, Ser. No. 194,160

Claims priority, application Netherlands, Oct. 10, 1979, 7907490

Int. Cl.³ H01J *17/49*

U.S. Cl. 313—584 9 Claims

1. A display device including a gas discharge display panel and means for driving the panel wherein the gas discharge display panel is provided with a gas-tight envelope and within said envelope comprises a set of N discharge cells arranged in a matrix of n rows and N/n columns, where n≧2, which set comprises first and second electrode means for selectively energising the N discharge cells, wherein the first electrode means comprises N column conductors extending transversely to the rows, with n column conductors for each column of discharge cells which n column conductors each has a discrete discharge surface element such that in each column of cells each cell has associated therewith for selectively energising the cell a respective one of the discrete discharge surface elements



and a surface element of the second electrode means, characterized in that the surface elements of the second electrode means of the set are electrically interconnected.

4,390,809

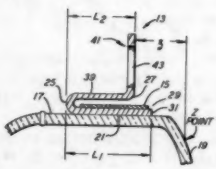
BRACKET SUPPORT MEANS FOR A CATHODE RAY TUBE

Robert B. Mitchell, Seneca Falls, and Harry R. Swank, Liverpool, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,328

Int. Cl.³ H04N *5/65*; H01J *29/87*

U.S. Cl. 313—482 4 Claims



1. Cathode ray tube bracket mounting means of the type employed in a multiple spaced-apart bracket tube-support system associated with implosion-inhibiting banding means oriented as a tensioned encompassment of the forward region of the tube adjacent the viewing area thereof, each of said brackets being formed from a longitudinal piece of substantially rigid material having first and second spatially-related transverse bends therein to provide predetermined integral bracket portions comprising: a seating portion having a longitudinal axis and evidencing length and width dimensions defined between longitudinal edges and a forward and an aft region thereof, said seating portion being of substantially arcuate shaping across said width dimension and extending longitudinally therein to substantially conform to discrete perimetrical surface regions of said tube to facilitate subsequent substantially contiguous placement of said seating portion between said banding means and the selected surface of said tube, said aft region being demarcated by said first transverse bend defining a U-shaped reverse curvature of said bracket material; an integral protruding portion extending forwardly from said first transverse bend in substantially spatial parallel relationship with said seating portion and having a fore-region terminated by said second transverse bend in said bracket material, said second transverse bend being rearward of the forward end of said seating portion; and an integral ear-like appendage portion upstanding in a substantially normal manner from said protruding portion at said second transverse bend, said appendage

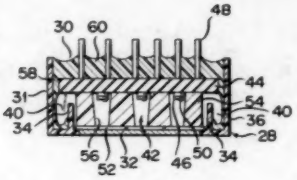
being in a plane substantially parallel with and normal to said subsequent banding orientation and having an aperture therethrough to facilitate subsequent attachment to appropriate tube supportive and positioning means associated with operational orientation.

4,390,810

SEMICONDUCTOR LIGHT-EMITTING DISPLAY DEVICE

Takeshi Biwa, Mizumaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 24, 1980, Ser. No. 162,512
Claims priority, application Japan, Jul. 9, 1979, 54/85895
Int. Cl.³ H05B *33/04;* H01L *33/00*
U.S. Cl. 313—500 **7 Claims**



1. A semiconductor light-emitting display device, comprising:

a casing having a display portion formed in a bottom wall thereof, side walls defining a predetermined number of corners, and an opening cut in the side opposite to the display portion, said display portion being formed of a transparent material;

a light-emitting assembly for emitting light through the display portion, the light-emitting assembly being housed in the casing and including at least one semiconductor light-emitting element provided with a light-emitting pattern;

a reflector disposed between the light-emitting assembly and the display portion of the casing for guiding the light emitted from the semiconductor light-emitting element to the display portion;

a resin layer sealing the gap between the light-emitting assembly and the casing near the opening for protecting the semiconductor light-emitting element from the external environment;

partition means mounted to the bottom wall for isolating a first space including at least one corner of the casing from a second space around said display portion; and

a resin reservoir formed by said partition means, the side walls of the casing, and the bottom wall of the casing for storing resin flowing toward said display portion through the corners of the casing when sealing the gap between the light-emitting assembly and the casing with said resin layer whereby flowing resin is prevented from reaching the display portion of the semiconductor light-emitting display device.

4,390,811

HIGH INTENSITY DISCHARGE LAMP INCLUDING ARC EXTINGUISHING MEANS

Harold L. Rothwell, Jr., Rowley; W. Calvin Gungle, Danvers, both of Mass., and Alan Daignault, Londonderry, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 16, 1981, Ser. No. 244,433
Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—73 **3 Claims**

1. A high intensity discharge lamp having:

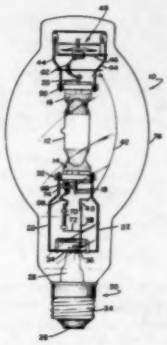
an inner arc tube having therein at least two electrodes between which a discharge takes place to produce visible light and ultraviolet radiation;

and an outer envelope substantially transparent to said visible light and opaque to said ultraviolet radiation, said outer envelope surrounding a volume having a pressure of the order of 100 torr;

a source of electrical power;

circuit means within said outer envelope electrically connecting said source of electrical power to said electrodes;

and lamp extinguishing means for interrupting said source of electrical power when the pressure in said outer envelope approaches atmospheric pressure, said lamp extinguishing means being serially connected between said source of



electrical power and one of said electrodes and being characterized by an electrically conductive, evacuated, hermetically sealed diaphragm have a first effective dimension at pressures near atmospheric pressure and a second effective dimension, larger than said first effective dimension, at pressures substantially less than atmospheric pressure;

one side of said diaphragm being permanently electrically connected to one of said electrodes and the other side of said diaphragm being temporarily electrically connected to a terminal which will shorten its effective length by melting back when subjected to an arc; said diaphragm being disc-shaped and being evacuated to a pressure of about 10–6 torr.

4,390,812

REGULATOR AND SWITCHING CIRCUIT FOR FLASHER UNITS

Robert L. Seidler, 104 Ridgewood Dr., Longwood, Fla. 32750

Filed Jun. 25, 1981, Ser. No. 277,241
Int. Cl.³ H05B *39/02, 39/09*
U.S. Cl. 315—200 A **17 Claims**

1. A voltage regulator and switching circuit for controlling the voltage across an incandescent lamp when the supply voltage is greater than the required lamp voltage for switching the lamp on and off, and for minimizing energy losses when the supply voltage is less than the required lamp voltage, comprising:

a switching silicon transistor having its emitter connected to one terminal of a source of varying voltage and its collector connected to said lamp, the other terminal of said lamp connected to the other terminal of said voltage source;

a driving transistor having its emitter connected to the base of said switching transistor and its collector connected to said collector of said driving transistor via a diode thereby forming a darlington connection when the potential at the collector of said switching transistor is less than the potential at the collector of said driving transistor;

a bypass resistor connected between the collector of said

driving transistor and the other terminal of said source of voltage;

an amplifier having inputs thereof controlled by a fixed reference voltage when the supply voltage is greater than the required lamp voltage, said amplifier having an output connected to the base of said driving transistor to thereby regulate the collector voltage of said switching transistor in proportion to said reference voltage, the voltage at the input to said amplifier held at essentially zero when said lamp is to be off and at the reference voltage when said lamp is to be on; and

voltage divider means connected to said inputs of said amplifier for providing a variable reference voltage when the supply voltage is less than the required lamp voltage, said voltage divider means selected to produce a low voltage drop across said switch transistor and a low value of drive current through said driving transistor;

whereby said driving transistor and said switching transistor function as a darlington pair at the turn on of said incandescent lamp during the time that the filament thereof is at a low resistance and said switching transistor functions as a single regulator transistor when the resistance of the lamp filament increases and reduces the current therethrough, and said bypass resistor provides a path for the drive current through said driving transistor.

4,390,813

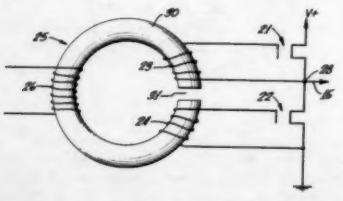
TRANSFORMER FOR DRIVING CLASS D AMPLIFIER

Charles A. Stanley, San Jose, Calif., assignor to Litek International Inc., Hayward, Calif.

Filed Jun. 29, 1981, Ser. No. 278,894

Int. Cl.³ H05B *41/24*; H01F *17/06, 19/04*

U.S. Cl. 315—248 **9 Claims**



5. In an electrodeless discharge lamp of the type including an ionizable medium within a sealed envelope capable of emitting radiant energy when subjected to a radio frequency field, an oscillator for generating an output signal at a given radio frequency, a Class D RF amplifier including first and second transistors connected in series and adapted to be driven alternately on and off by said oscillator output signal, a transformer including a toroidal, magnetic core, a primary winding on said core responsive to said oscillator output signal, first and second secondary windings on said core coupled to said first and second transistors, respectively, said primary and secondary windings being spaced around said core, and an induction coil responsive to the output of said amplifier, said coil being positioned in close physical proximity to said medium in said envelope for coupling to said medium an electric field having a magnitude sufficient to initiate ionization of said medium and a magnetic field for maintaining said ionization, the improvement comprising:

means for isolating said secondary windings from each other, said means comprising:

means forming a high reluctance path between said secondary windings.

4,390,814

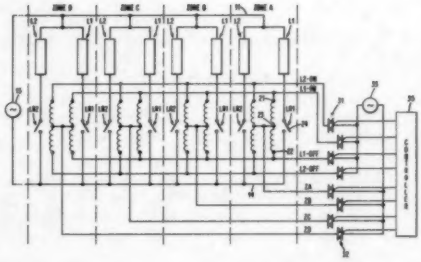
LIGHTING APPARATUS

Sanford C. Peck, Andover, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 7, 1981, Ser. No. 261,391

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—320 **9 Claims**



1. Lighting apparatus for controlling the lighting level in a multiplicity of lighting zones comprising

a plurality of lamp units located at each of said zones;

a set of switching means located at each of said zones, each set having switching means corresponding to those of every other set;

each lamp unit being connected to a source of electrical power for operating the lamp unit through a switching means at the associated zone;

each switching means having first, second, and common terminals; said switching means being operable to be latched in a closed circuit condition in response to simultaneous signals at the first and common terminals, and being operable to be latched in an open circuit condition in response to simultaneous signals at the second and common terminals;

the common terminals of the switching means within each set being connected together providing a multiplicity of enable connections;

the first terminals of the corresponding switching means from each set being connected together providing a group of ON connections;

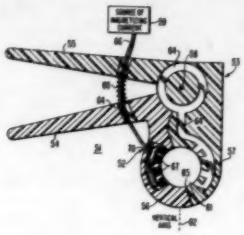
the second terminals of the corresponding switching means from each set being connected together providing a group of OFF connections; and

control means for selectively applying a signal to selected connections of said groups of ON and OFF connections and for selectively applying a signal simultaneously to selected enable connections whereby predetermined lamp units are selectively turned on or off.

4,390,815
APPARATUS FOR INFLUENCING ELECTRON BEAM MOVEMENT

Charles W. Key, Bloomington, and Edward W. Christensen, II, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,664
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—368 **10 Claims**



1. Apparatus for influencing movement of electron beams in a cathode ray tube, comprising:

means for magnetizing a strip of magnetizable material disposed about the neck of said tube to produce permanently magnetized regions on said strip for influencing the movement of said beams, comprising:

a first member incorporating first magnetizing coils;

a second member separate from said first member and incorporating second magnetizing coils coupled to said first coils;

means coupled to said first and second members for selectively providing a first opened position of said members for placing said magnetizing means on said tube neck from a position substantially perpendicular to said tube neck and a second closed position of said members with said magnetizing means encircling said neck;

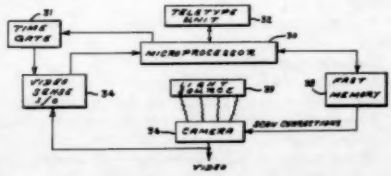
a source of magnetizing current; and

means coupling said source of magnetizing current to said first and second magnetizing coils for developing magnetic fields in the vicinity of said coils for magnetizing said magnetizable strip.

4,390,816
SCAN CORRECTED VIDICON CAMERA APPARATUS

Milton L. Noble, Liverpool, and William G. Hoefer, Syracuse, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 23, 1980, Ser. No. 200,226
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—370 **9 Claims**



1. A scan corrected vidicon camera apparatus comprising in combination:

a light source providing illumination

a vidicon camera focused upon said illumination and being uniformly illuminated by said light source, said vidicon camera providing a video output,

a pair of spatial reference filters directly mounted in said vidicon camera to provide a compound spatial reference, said vidicon camera having a faceplate and a target, said pair of spatial reference filters positioned between faceplate and said target,

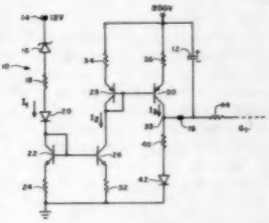
a video sense unit receiving said video output, said video sense unit sampling said video output and providing a digital word therefor, and

a microprocessor unit receiving said digital word, said microprocessor including a control unit to initiate a calibration sequence within said microprocessor and a fast memory to store data therein, said microprocessor unit injecting a perturbation into said vidicon camera, said microprocessor unit utilizing said digital word to maximize said video output.

4,390,817
INTEGRATABLE CRT SPOT CUT-OFF NETWORK

Fred D. Johnson, Evanston, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 27, 1981, Ser. No. 238,771
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—384 **4 Claims**



1. In a television receiver which develops at least one supply voltage and which includes a CRT having one or more grids, an improved spot cut-off network for a grid, comprising:

a current generator powered by the supply voltage for establishing a reference current, and responsive to a collapse of the supply voltage for rapidly terminating the reference current;

a biasing resistance having one end thereof coupled to the grid;

a diode coupled between a reference potential and the other end of the biasing resistance;

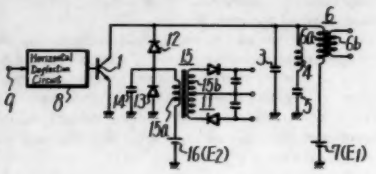
a capacitor coupled between a supply voltage and said one end of the biasing resistance for bypassing A.C. signals at the grid and for charging toward the latter supply voltage through the biasing resistance and the diode; and

transistor means comprising a current mirror adapted to be turned on by and to mirror the reference current into the biasing resistance so as to establish a forward grid bias across the biasing resistance and diode, and adapted to be turned off by the termination of the reference current for terminating the mirrored current and for inhibiting the capacitor from discharging into said transistor means, whereby the charge stored on the capacitor reverse biases the grid when the reference current terminates so that the CRT beam is cut off.

4,390,818
TELEVISION RECEIVER

Tamiji Nagai, Kawasaki, and Yoshio Ishigaki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 286,205
Claims priority, application Japan, Jul. 25, 1980, 55-102577
Int. Cl.³ H01J 29/70
U.S. Cl. 315—408 7 Claims



1. In a television receiver of the type including a first load circuit having a transformer with a winding, apparatus comprising:

horizontal output transistor means having an output path connected between a first terminal at a first potential and a second terminal at a second potential;

first series circuit means comprised of at least first and second damper means connected together at a connection point and connected in series between said first and second terminals;

second series circuit means comprised of deflection coil means and S-shaping capacitor means connected in series between said first and second terminals;

retrace capacitor means connected between said first and second terminals;

third capacitor means connected between said connection point and said second terminal;

choke coil means;

first voltage supply source means connected to said first terminal through said choke coil means; and

second voltage supply source means connected to said connection point through the winding of said transformer of said first load circuit, the voltage supplied by said first voltage supply source means being selected to be at least as large as the voltage supplied by said second voltage supply source means.

4,390,819
TELEVISION RECEIVER FERRORESONANT POWER SUPPLY USING A TWO-MATERIAL MAGNETIZABLE CORE ARRANGEMENT

William E. Babcock, Warren, and Frank S. Wendt, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

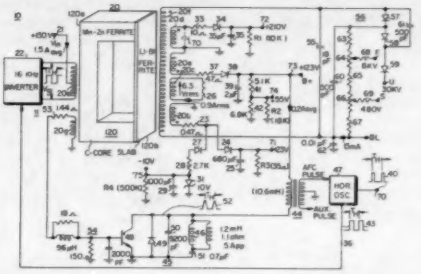
Filed Apr. 2, 1981, Ser. No. 250,130
Int. Cl.³ H01J 29/70
U.S. Cl. 315—411 22 Claims

1. Apparatus for a television display including an ultor voltage power supply and a saturating core regulating transformer capable of operating over a range of temperatures without thereby being subject to undesirably large changes in an output voltage of said transformer, comprising:

a magnetizable core including first and second core sections;

a plurality of windings including a first winding wound on said first core section and arranged for coupling to a source of exciting current for generating a magnetic flux in said magnetizable core, a second one of said plurality of windings being wound on said second core section such that magnetic flux that links said second winding develops an alternating polarity output voltage across said second winding;

a capacitance coupled to one of said plurality of windings that is wound on said magnetizable core for developing a circulating current in the capacitance coupled winding to produce a magnetic flux that aids in substantially magnetically saturating at least a portion of said second core section during each polarity interval of said alternating polarity output voltage for regulating said output voltage, said first core section being operated in the magnetically unsaturated region of the B-H loop characteristic of the first core section magnetizable material,



wherein the magnetizable material of the magnetically saturating second core section is selected to have a higher Curie temperature than that of the magnetizable material of the substantially nonsaturating first core section;

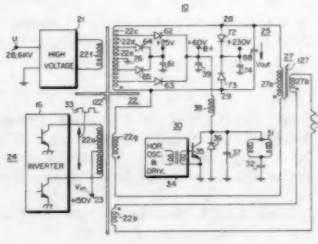
an ultor terminal; and

means including a high voltage rectifier arrangement coupled to said ultor terminal for developing an ultor voltage from said regulated output voltage.

4,390,820
TELEVISION RECEIVER FERRORESONANT LOAD POWER SUPPLY DISABLING CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 3, 1981, Ser. No. 298,973
Int. Cl.³ H01J 29/70
U.S. Cl. 315—411 8 Claims



1. A disabling circuit for a television display system, comprising:

a source of input voltage;

a transformer including primary and secondary windings; said primary winding being coupled to said source for developing an alternating supply voltage across said secondary winding;

a self-regulating load circuit including a saturable reactor having a first winding coupled to said transformer secondary winding for regulating said supply voltage;

a tertiary winding of said transformer for stepping up said regulated supply voltage;

a high voltage circuit coupled to said tertiary winding for developing an ultor accelerating potential for a picture tube of said television display system;

a load circuit within said television display system; and

means coupled to said television display system load circuit and to said saturable reactor first winding for energizing said television display system load circuit such that the disconnection of said saturable reactor first winding from said transformer secondary winding disables the normal energization of said television display system load circuit.

4,390,821

DEVICE FOR CHANGING THE RELATIVE ANGULAR POSITIONS OF OPERATING SHAFTS OF A GROUP ELECTRIC DRIVE

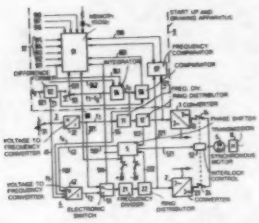
Dietrich Krampe, Neunkirchen, and Herbert Schleicher, Dettingen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 136,356, Apr. 1, 1980. This application Aug. 3, 1981, Ser. No. 289,169

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2515035

Int. Cl.³ H02P 5/46

U.S. Cl. 318—85 **3 Claims**



1. A control for an electric motor drive comprising:

at least first and second individual drive shafts, the first drive shaft driven by a first synchronous motor and the second drive shaft driven by a second synchronous motor;

a first frequency generator having a predetermined frequency output;

a second frequency generator having an output frequency which is variable in response to at least one frequency control signal;

a first static converter having an input coupled to the output of the first frequency generator and having a predetermined output voltage;

a second static converter having an input and having an output voltage equal in amplitude to that of the first static converter;

means coupling the first synchronous motor to the output of the first static converter;

first switching means coupling the input of the second static converter to at least one of the output of the first frequency generator and the output of the second frequency generator;

second switching means for transferring the input of the second synchronous motor between the output of the first static converter and the output of the second static converter, whereby, without noticeable phase angular error, the second synchronous motor can be switched to the second static converter for changing the phase angle position of the second synchronous motor relative to the first synchronous motor, and the input of the second synchronous motor can be subsequently switched back to the output of the first static converter;

means responsive to phase difference between the inputs to the first and second static converters for enabling the second switching means to reconnect the second synchronous motor to the first frequency converter when the desired angular position has been reached and when the phases of the output voltages of the static converters are in agreement; and

means coupled to the second frequency generator for driving the second static converter to start up and to brake the second synchronous motor.

4,390,822

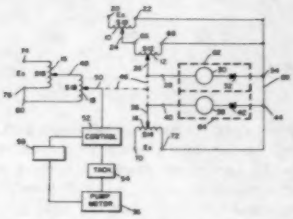
RATIO CONTROL SYSTEM

Bernard Wechsler, 2831 E. White Star Ave., Ste. "D", Anaheim, Calif. 92806

Filed Jul. 31, 1981, Ser. No. 288,681

Int. Cl.³ H02P 7/74

U.S. Cl. 318—114 **4 Claims**



1. Apparatus for continuously feeding materials to be mixed together in ratios comprising:

means for providing ratios of electrical voltages, said means comprising:

at least one first ratio autotransformer having input terminals and a wiper arm having an output terminal and responsive to a supply voltage;

at least one first supply autotransformer having input terminals and a wiper arm having an output terminal and said at least one first supply autotransformer responsive to output voltage from said at least one ratio autotransformer;

at least one second supply autotransformer having input terminals and a wiper arm having an output terminal and said at least one second supply autotransformer responsive to said a supply voltage;

means for actuating the wiper arm of said at least one first supply autotransformer in relation to the wiper arm of said at least one second supply autotransformer;

means responsive to said means for providing ratios of electrical voltages for feeding selected ratios of materials to be mixed together, said responsive means comprising:

at least one first vibrator system having external terminals to receive electrical input from said means for providing ratios of electrical voltages;

mechanical means to provide vibrations in response to electrical input received by means of said external terminals;

rectifying means to rectify the electrical input received by means of said external terminals;

at least one second vibrator system having external terminals to receive electrical input from said means for providing ratios of electrical voltages;

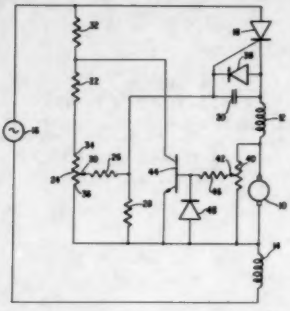
mechanical means to provide vibrations in response to electrical input received by means of said external terminals; and

rectifying means to rectify the electrical input received by means of said external terminals.

4,390,823
MOTOR CONTROL SYSTEM INCORPORATING TOP SPEED LIMITING ARRANGEMENT

Jack Brown, Union, and John W. Wurst, Dover, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 8, 1979, Ser. No. 10,453
Int. Cl.³ H02P 5/16
U.S. Cl. 318—331 5 Claims



1. A motor control system for operating a motor at preselected speeds and including means for connecting said system to a cyclically varying power supply, a phase control circuit connected between said motor and said power supply, means for setting a speed for said motor, and a firing circuit coupled to said phase control circuit for phase firing said phase control circuit to supply power to said motor during a portion of the cycle of said power supply in accordance with the setting of said setting means,

wherein the improvement comprises means for limiting the top speed of said motor including:

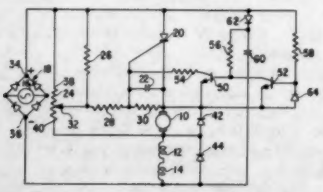
means for providing a signal corresponding to the speed of said motor when said phase control circuit is not supplying power to said motor; and

limiting means responsive to said signal for preventing said firing circuit from operating when said signal is above a predetermined threshold value corresponding to a desired top speed and for allowing said firing circuit to operate in accordance with the setting of said speed setting means when said signal is below said predetermined threshold value, whereby motor speed control is effected by the setting of said speed setting means only up to said desired top speed.

4,390,824
FULL WAVE MOTOR CONTROL CIRCUIT

Jack Brown, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 12, 1981, Ser. No. 273,173
Int. Cl.³ H02P 5/16
U.S. Cl. 318—331 2 Claims



1. A system for operating a motor from an alternating current power source comprising:

a full wave rectifier having an input connected to said source and having positive and negative output terminals;

a silicon controlled rectifier connected in series with said motor between said output terminals of a polarity to allow current to flow through said silicon controlled rectifier and said motor when said silicon controlled rectifier is turned on;

a charging capacitor connected across the gate and cathode of said silicon controlled rectifier;

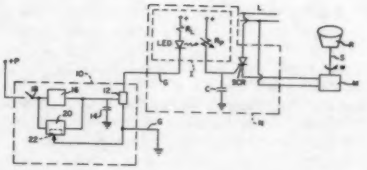
current control means connected in circuit with said charging capacitor for controlling the current supplied to said charging capacitor, the rate at which current is supplied to said charging capacitor controlling the motor speed by determining the point in each cycle of the power source when said silicon controlled rectifier is turned on; and

discharge means effective during every cycle of the full wave rectifier output and responsive to the level of the full wave rectifier output being below a predetermined threshold for providing a discharge path for said charging capacitor and for raising the effective holding current level for said silicon controlled rectifier.

4,390,825
AUTO-THRESHOLD SLOW START CONTROL CIRCUIT FOR A CENTRIFUGE

David W. Ginn, Newtown, Conn., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 26, 1981, Ser. No. 277,875
Int. Cl.³ H02P 5/16
U.S. Cl. 318—384 5 Claims



1. A slow start control network for use with a drive motor control arrangement for a centrifuge comprising:

a circuit element having a predetermined transfer function connectable to the drive motor control arrangement;

a charging capacitor adapted to apply a predetermined triggering signal to the circuit element to trigger the same and initiate current flow through the drive motor control arrangement;

a primary current source for charging the capacitor;

a supplemental current source for providing a supplemental current to the capacitor to assist the charging of the capacitor; and

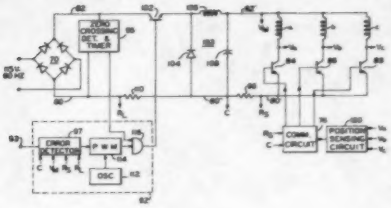
means responsive to the flow of current through the drive motor control arrangement to disconnect the supplemental current source from the capacitor.

4,390,826

LAUNDERING APPARATUS, METHOD OF OPERATING A LAUNDRY MACHINE, CONTROL SYSTEM FOR AN ELECTRONICALLY COMMUTATED MOTOR, METHOD OF OPERATING AN ELECTRONICALLY COMMUTATED MOTOR, AND CIRCUIT

David M. Erdman, and Harold B. Harms, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 77,776, Sep. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 802,484, Jun. 1, 1977, Pat. No. 4,169,990, which is a continuation-in-part of Ser. No. 729,761, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,409, Jun. 24, 1974, Pat. No. 4,005,347. This application Apr. 17, 1980, Ser. No. 141,268
Claims priority, application Canada, Sep. 12, 1980, 360269; European Pat. Off., Apr. 16, 1981, 81-3017118
Int. Cl.³ H02P 5/06
U.S. Cl. 318—439 21 Claims



1. A circuit for controlling the energization of an electrical load from an AC source comprising:

a pair of DC lines;

means for rectifying the AC output of the source to apply a DC voltage across said DC lines in the form of a full wave rectified sinusoidal signal;

means connected between said DC lines and the load for chopping the full wave rectified sinusoidal signal to provide pulses at a frequency which is high with respect to the frequency of the full wave rectified sinusoidal signal;

means responsive to an externally derived signal representative of the desired energization of the load for modulating the width of the pulses;

means responsive to current in said DC lines for modifying the externally derived signal to maintain the amplitude of the DC line current below a predetermined level;

means for detecting zero crossovers of the full wave rectified sinusoidal signal; and

means responsive to said detecting means for applying the pulses only during a predetermined time interval in each half cycle of the full wave rectified sinusoidal signal, the initiating and terminating points of each of the time intervals being spaced substantially equal phase angles away from the initiating and terminating zero crossovers that define the corresponding half cycle of the full wave rectified sinusoidal signal, respectively;

whereby the load presents a high power factor to the AC source.

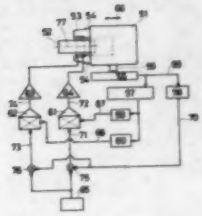
4,390,827

LINEAR MOTOR

Issei Imahashi, Yamanashi, Japan, assignor to Telmec Co., Ltd., Japan

Filed Feb. 5, 1981, Ser. No. 231,759
Claims priority, application Japan, Feb. 13, 1980, 55-016284
Int. Cl.³ G05B 11/00
U.S. Cl. 318—687 6 Claims

1. A linear motor comprising a stator formed by juxtaposing a large number of magnetic path members for establishing magnetic fields having alternately reversed directions of magnetic paths, along a straight line; first and second coils having a mutually fixed relationship, said coils being disposed within the magnetic fields established by said magnetic path members; first and second current amplifiers having variable amplification factors, said first and second amplifiers being connected to said first and second coils, respectively; a position detector for detecting the position of said coils; a frequency voltage converter for receiving the output of said position detector and



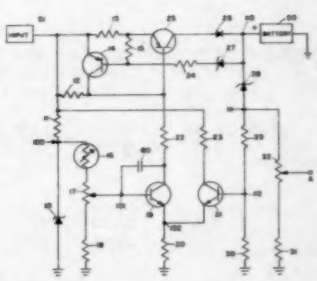
providing a signal representative of the speed of said coils relative to said magnetic path members; a counter connected to said position detector for determining the position of said coils relative to said magnetic path members; and two memory devices for receiving the output of said counter and determining variable amplification factors for said current amplifiers for driving said coils relative to said magnetic path members.

4,390,828

BATTERY CHARGER CIRCUIT

Merle E. Converse, Helotes, and Glenn T. Darilek, San Antonio, both of Tex., assignors to Transaction Control Industries, Bryan, Tex.

Filed Mar. 17, 1982, Ser. No. 359,021
Int. Cl.³ H02J 7/04
U.S. Cl. 320—32 7 Claims



1. A battery charger comprising:

means for generating a charging voltage and current;

means for electrically connecting said means for generating a charging voltage and current to a battery;

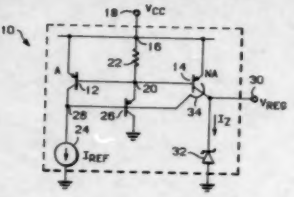
means for sensing the charge state of said battery; and,

means responsive to the charge state of said battery for increasing the charging voltage and current from an initial level to a relatively constant current level to a relatively constant voltage level wherein the current is reduced from the constant current level to zero in proportion to the amount of charge stored in said battery.

4,390,829
SHUNT VOLTAGE REGULATOR CIRCUIT

Robert B. Jarrett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 1, 1981, Ser. No. 269,184
Int. Cl.³ G05F 3/18
U.S. Cl. 323—231 **3 Claims**



1. A monolithic integrated regulator circuit for providing a regulated voltage at an output thereof in response to an unregulated voltage supplied thereto whenever the magnitude of the unregulated voltage is greater than a predetermined value but less than a predetermined maximum value and having a minimum voltage differential between the input and output thereof, comprising:

a first PNP transistor having an emitter region, a base region and a collector region, said emitter region being coupled to the input of the regulator circuit;

a second PNP transistor having an emitter region, a base region and a collector region, said emitter region having an area N times greater than the area of said emitter region of said first PNP transistor and being coupled therewith, said base region being coupled to said base region of said first PNP transistor, said collector being coupled to the output of the regulator circuit;

a current source coupled to said collector region of said first PNP transistor for sourcing a current therefrom;

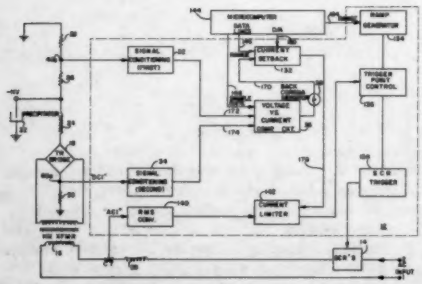
a Zener diode coupled in shunt to the output of the regulator circuit; and

collector circuit means coupled to said current source for collecting current that otherwise would be injected into the substrate of the integrated regulator circuit when said second PNP transistor becomes saturated wherein the current flow through said first transistor is reduced.

4,390,830
BACK CORONA DETECTION AND CURRENT SETBACK FOR ELECTROSTATIC PRECIPITATORS

Thomas C. Laugesen, Silverton, N.J., assignor to NWL Transformers, Bordentown, N.J.

Filed Oct. 15, 1981, Ser. No. 311,870
Int. Cl.³ G05F 1/455
U.S. Cl. 323—237 **6 Claims**



1. A control system for monitoring across an electrostatic precipitator the departure of current from voltage at the start of a back corona condition and continuously reducing the current until said back corona condition is substantially minimized comprising

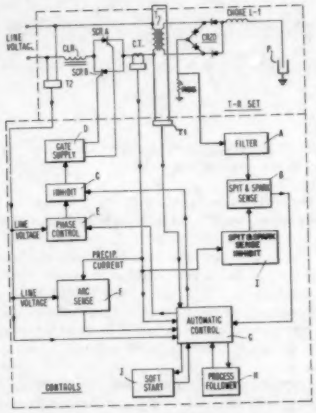
means for comparing the voltage and current applied to the precipitator for detecting when said current increases at a faster rate than said voltage for producing a signal indicating a back corona condition, and

means for setting back said current in response to said back corona condition signal for substantially minimizing said current while maximizing said voltage to maintain normal precipitator operation at the knee of the voltage/current curve.

4,390,831
ELECTROSTATIC PRECIPITATOR CONTROL

William Byrd, Princeton, and Stephen J. Kohke, Martinsville, both of N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Continuation of Ser. No. 76,496, Sep. 17, 1979, abandoned. This application May 18, 1981, Ser. No. 264,577
Int. Cl.³ B03C 3/68
U.S. Cl. 323—240 **25 Claims**



1. Electronic apparatus providing means for controlling AC voltage and current supplied from a source to the primary of a transformer/rectifier set (T/R set) feeding a load circuit comprising an electrostatic precipitator which is subject to spitting, sparking, arcing or shorting, said control means comprising:

a. inductive series impedance in the circuit of said transformer sufficient to limit transient primary currents to an acceptable maximum value in the event of said spitting, sparking, arcing or shorting in said load circuit;

b. a pair of silicon controlled rectifiers (SCR's) in inverse-parallel connection in circuit with said primary of said transformer of said T/R set;

c. gate current supply means connected to the gates of said SCR's for controlling the condition thereof;

d. phase control means for providing output signals which are phase controlled with respect to line voltage;

e. means for supplying voltage representative of AC line voltage to said phase control means;

f. means for developing an AC current signal whose instantaneous values and polarities represent the instantaneous values of current drawn from the source of AC voltage;

g. means for developing an AC voltage pulse during a set time interval following each zero crossing of the AC voltage supply, the polarity of said voltage pulse being the

same as the polarity of said AC voltage supply during said set interval;

h. AC sensing means developed by said AC current signals and said AC voltage pulses for producing an output signal only when said current signal exceeds a set minimum value during a voltage pulse and has reverse polarity with respect to the polarity of said voltage pulse;

i. direct current sensing means for developing output signals in response to sudden changes of current in the load circuit of said T/R set resulting from said spitting and sparking;

j. an automatic control system;

k. means for applying said output signals developed by either or both of said sensing means to said automatic control system;

l. means for applying output signals from said automatic control system to said phase control means;

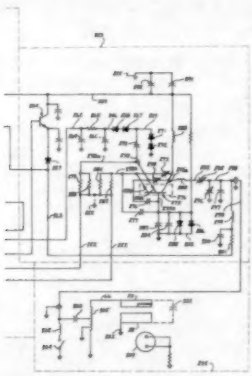
m. means for applying output signals from said phase control means to said gate current supply means for controlling the conduction of said SCR's.

4,390,832

CIRCUIT FOR ELECTRO MECHANICAL TUBING SEALER

Junius E. Taylor, Tempe, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Continuation of Ser. No. 122,293, Feb. 19, 1980, abandoned.
This application Dec. 28, 1981, Ser. No. 334,749
Int. Cl.³ H05B *9/04*; B32B *19/02*; G05F *1/44*
U.S. Cl. 323—273 **5 Claims**



1. A circuit for delivering a predetermined level of energy to an impedance load having variable capacitance and resistance, said circuit comprising in combination:

(a) oscillator circuit means for producing a high frequency electromagnetic variable ouput energy on an output of said oscillator circuit means, said oscillator circuit means having a supply voltage input for receiving a variable amplitude constant frequency supply voltage required for operation of said oscillator circuit means;

(b) variable impedance load means for receiving electromagnetic energy from said oscillator circuit means;

(c) a cable coupled between said load means and said oscillator circuit means for conducting the electromagnetic energy from said oscillator circuit means to said load means, said load means presenting a variable impedance to said cable when the load impedance is varied and causing a change in voltage at the output of said oscillator circuit means;

(d) power circuit means connected to said supply voltage input for providing the variable amplitude constant frequency supply voltage to said oscillator circuit means, said power circuit means having a control input for controlling the amplitude of the supply voltage; and

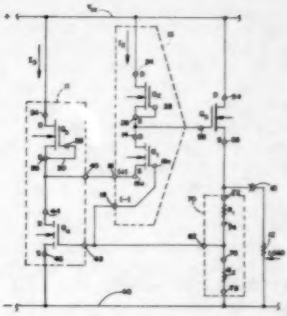
(e) control means responsive to the variable output voltage and coupled between the output of said oscillator circuit means and the control input of said power circuit means for altering the control voltage at the control input of said power circuit means to vary the amplitude of the supply voltage provided by said power circuit means to said oscillator circuit means and to vary the amplitude of the output voltage at the output of said oscillator circuit means conducted via said cable to said load means.

4,390,833

VOLTAGE REGULATOR CIRCUIT

Chin-Pyng J. Tzeng, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 22, 1981, Ser. No. 266,239
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—280 **18 Claims**



1. A voltage regulator circuit adapted to operate between a voltage source and a voltage source return, to supply a predetermined output voltage at an output voltage terminal to a load comprising:

an inverter means having an inverter input terminal and an inverter output terminal, for inverting and amplifying the voltage difference between a voltage received at said inverter input terminal and a relatively fixed inverter threshold voltage, said inverter means providing an inverted control voltage at an inverter output terminal,

an output voltage scaling means having an input terminal providing a scaled output voltage signal at said output terminal,

an amplifier means having a non-inverting input terminal and an inverting input terminal and an output terminal, for amplifying the voltage difference between said non-inverting input and said inverting input to provide an output voltage determining control signal at said amplifier means output terminal,

said inverter output terminal being connected to said amplifier means non-inverting input terminal, and

said output voltage scaling means output terminal being connected to said inverter means inverter input terminal and to said amplifier means inverting input terminal,

an output multiterminal semiconductor device having a first and second conduction path terminal and a control terminal, said first conduction path terminal being connected to said voltage source, said second conduction path terminal being connected to said output voltage terminal, said control terminal being connected to said amplifier means output terminal and being responsive to said output voltage determining control signal to provide current to said load in relatively constant output voltage determining relation.

4,390,834

DIGITAL VOLUME CONTROL

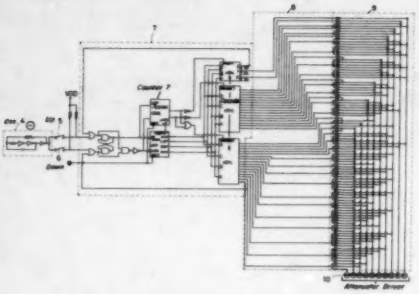
Akihiro Obshita, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 188,566, Sep. 18, 1980. This application Mar. 19, 1982, Ser. No. 360,049

Claims priority, application Japan, Feb. 25, 1980, 55/23283

Int. Cl.³ H02J 3/12

U.S. Cl. 179—1 VL 9 Claims



1. A volume control circuit comprising:

encoder means for generating attenuation constraining enabling signals for said semiconductor switch means;

actuator means for initiating volume control operation by generating a number of pulses;

counter means for counting the number of pulses supplied via said actuator means and providing an electrical representation of the number of said pulses to said encoder means to define a corresponding attenuation level and

attenuator circuit means connected to said semiconductor switch means for providing the level of attenuation constrained by said encoder means.

4,390,835

FAULT IDENTIFICATION IN ELECTRIC POWER TRANSMISSION SYSTEMS

Makeen M. Elkateb, and William J. Cheetham, both of Stafford, England, assignors to The General Electric Company Limited, London, England

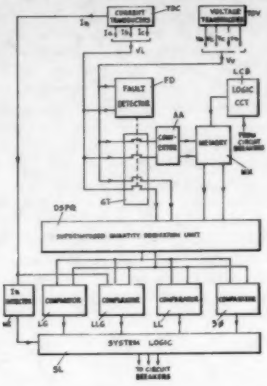
Filed Sep. 24, 1980, Ser. No. 190,268

Claims priority, application United Kingdom, Sep. 27, 1979, 7933571

Int. Cl.³ G01R 31/02

U.S. Cl. 324—51 15 Claims

1. A method of identifying faults in a polyphase alternating current electric power transmission system wherein determination of the type of fault occurring is effected by monitoring, using analogue techniques, the instantaneous values of quantities which are combinations of at least two of the group com-



prising the superimposed currents and the superimposed voltages arising in the system on occurrence of a fault.

4,390,836

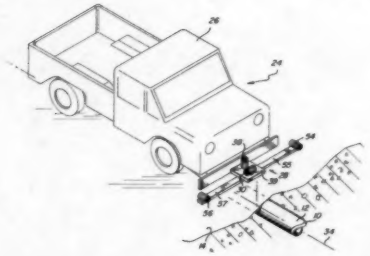
METHOD AND APPARATUS FOR THE DETECTION OF PIPELINE HOLIDAYS

Charles R. Bruce, Littleton, and Irvin D. Johnson, Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 11, 1980, Ser. No. 177,156

Int. Cl.³ G01R 31/00, 31/12; G01V 3/165

U.S. Cl. 324—54 10 Claims



10. A method of detecting and locating a holiday in an insulating coating of a subterranean electrically conductive pipeline comprising:

inducing an alternating electrical current in at least a portion of the pipeline,

orienting a pair of coil members on opposite sides of a vertical plane including the longitudinal axis of the pipeline in generally longitudinally parallel relationship relative to the pipeline,

moving the pair of coils through an electromagnetic field generated by electric current flowing in a direction normal to the central axis of the pipeline through a holiday in the insulating coating of the pipeline whereby an electrical current signal is induced in the pair of coil members representative of the presence and magnitude of the holiday,

displaying the electrical current signal, and

sensing a normal electromagnetic field generated by the current flowing axially in the pipeline, determining the relative relationship between the pair of coil members and the pipeline from the sensed normal electromagnetic field

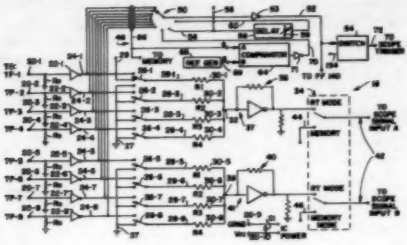
and then guiding the pair of coil members through the electromagnetic field generated by electrical current flowing radially through the holiday in response to the sensed normal electromagnetic field.

4,390,837

TEST UNIT FOR A LOGIC CIRCUIT ANALYZER

Kevin Hotvedt, 1826 Vera Ave., Redwood City, Calif. 94061

Filed Aug. 25, 1980, Ser. No. 180,849
Int. Cl.³ G01R *15/12*
U.S. Cl. 324—73 R **22 Claims**



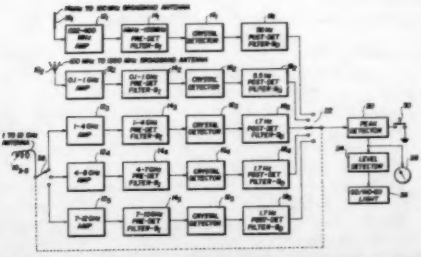
1. A test unit for identifying output signals at a plurality of test points of a logic circuit on an oscilloscope having a scope signal input and a scope triggering input, said unit comprising:
(a) a plurality of test probes being connectable to the plurality of test points to sense the output signals, respectively;
(b) means for producing summed signals;
(c) a plurality of impedance elements having different weighted values, each of said impedance elements being connected between one of said test probes and said producing means;
(d) means for coupling the summed signals to the scope signal input;
(e) means for selectively coupling and decoupling said test probes from said producing means; and
(f) means for supplying a triggering signal to the scope triggering input in response to one of the sensed output signals.

4,390,838

BROADBAND MEASUREMENT SYSTEM

John W. Savage, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,558
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 E **17 Claims**



1. A method of measuring the emission of electromagnetic energy over a relatively wide bandwidth comprising the steps of:
receiving electrical signals of said emission;
applying said signals to a detection circuit having a response characteristic where the ratio of the impulse signal response to the CW signal is a predetermined function of said detection circuit defined by the relationship:

$$r = 1/(2B_O B_I - B^2_O)^{0.5}$$

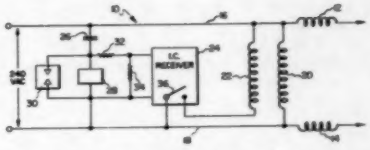
wherein r is the ratio of the impulse signal response to the CW signal response, B_I is the pre-detection bandwidth of said detection circuit, and B_O is the post-detection bandwidth of said detection circuit;
detecting said electrical signals in said detection circuit and providing video output signals therefrom; and
applying said video output signals to a measuring circuit operative to determine the amplitude of said video output signals.

4,390,839

METHOD AND APPARATUS FOR TONE CONTROLLED VARIABLE SENSITIVITY TIME-OF-DAY WATT-HOUR METERING

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,451
Int. Cl.³ G01R *15/08*; H04B *3/54*
U.S. Cl. 324—116 **20 Claims**



1. A time-of-day watt-hour meter for measuring energy supplied over a pair of alternating current power line conductors comprising:
a rotor for driving a set of dials;
at least one current coil connected in series with at least one of said power line conductors;
at least one voltage coil connected between said pair of power line conductors, said rotor and coils being configured to operate as an induction motor; and
means for selectively adjusting the sensitivity of said voltage coil for a predetermined portion of a predetermined time interval to cause said rotor to rotate at a faster rate during the time during which said signals bearing tone burst information are received than during the time during which no such signals are received, said means being responsive to signals bearing tone burst information at a predetermined frequency present on said power line, said tone burst frequency being higher than the A.C. power delivery frequency supplied over the conductor pair.

4,390,840

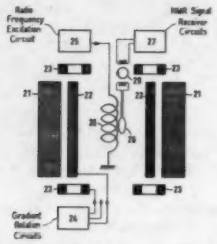
ZEUGMATOGRAPHY PROCESS

Alexander Ganssen; Arnulf Oppelt, both of Erlangen, and Wilfried Loeffler, Herzogenaurach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,145
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951537
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—309 **2 Claims**

1. A method of producing an image representing nuclear spin density information for a body, using nuclear magnetic resonance signals, characterized in that, for the purpose of locally-resolved detection of such nuclear spin density information in said body, said method comprises

(a) subjecting the body to a constant magnetic field B_o along one axis,
(b) superimposing, transversely to said one axis, a linear field gradient dBo/dr, which can be rotated in a stepwise fashion through at least 180 degrees about said one axis,
(c) varying the frequency of an exciting radio frequency field B_1 such that fast adiabatic resonance passages are excited in a region of the body to be examined,
(d) detecting the variation in magnetization alone said one



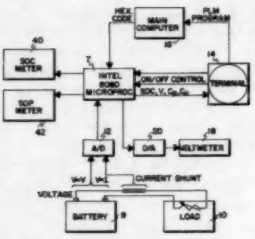
axis synchronously with the frequency variation of the radio frequency field B_1 to derive a projection of the nuclear spin density perpendicularly to the superimposed field gradient,
(e) successively rotating the field gradient in a stepwise fashion about said one axis, and for each successive rotation of the field gradient, repeating the detecting step (d) so that a plurality of projections are measured, and
(f) constructing from said projections an image of the nuclear spin density.

4,390,841

MONITORING APPARATUS AND METHOD FOR BATTERY POWER SUPPLY

Harry L. Martin, Knoxville, Tenn., and Raymond E. Goodson, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 14, 1980, Ser. No. 196,398
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—427 **12 Claims**



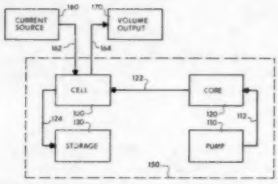
1. A monitoring device for a battery power supply, said device comprising:
input means adapted to receive a current signal from a battery power supply to be monitored;
first capacity means connected with said input means to receive said current signal therefrom and responsive thereto providing an output signal indicative of the used capacity of a said battery power supply then being monitored;
second capacity means connected with said input means to receive said current signal therefrom, said second capacity means providing predicted parameters dependent upon the diffusion characteristics of said battery power supply, and said second capacity means being responsive to said current signal and to said predicted parameters of said battery power supply to provide an output signal indicative of the predicted remaining capacity of a said battery power supply then being monitored; and
determining means connected with first and second capacity means to receive said outputs therefrom and responsive thereto providing an output signal indicative of the state-of-charge of said battery power supply then being monitored.

4,390,842

FLUID CONDUCTIVITY DEVICE FOR MEASURING FLUID VOLUMES AND METHOD THEREFOR

N. Duane Wygant, Sedalia, and Stanley C. Jones, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 23, 1980, Ser. No. 219,562
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—439 **12 Claims**



1. A device for measuring the volume of each fluid in a fluid mixture, said fluid mixture flowing at a constant volumetric flow rate and each fluid in said mixture having a different electrical conductivity, said device comprising:
means (**600**) receiving said mixture (**300**) for separating said mixture (**300**) in a formed passageway (**200**) into separate individual fluid droplets (**310, 320**), said separating means (**600**) being capable of maintaining said constant volumetric flow of said mixture (**300**), and
means (**400, 170**) operatively interconnected with said separating means (**600**) for determining the time required for each droplet (**310, 320**) to flow through said passageway (**200**) by sensing the electrical conductivity of each droplet (**310, 320**) commencing with the leading interface (**500**) and ending with the lagging interface (**510**) as it passes through said passageway (**200**), said determined time being proportional to the volume of said droplet (**310, 320**).

4,390,843

TELEPHONE SYSTEM RING PERIOD DETECTOR

William L. Betts, Maderia Beach, and Kenneth Martinez, Pinellas Park, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Feb. 9, 1981, Ser. No. 232,703
Int. Cl.³ H03K *9/08*
U.S. Cl. 328—138 **4 Claims**

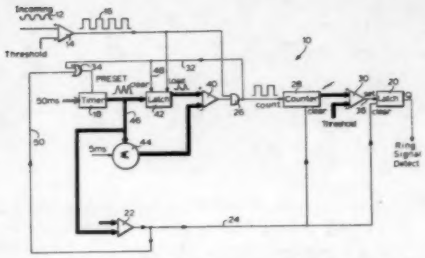
1. A circuit for differentiating a first waveform signal from a second waveform signal of lower frequency comprising:
detecting circuit means having an input for receiving an incoming waveform signal and producing a train of output pulses, the interval between pulses corresponding generally to the period of said waveform;
a timer adapted to count down from a time less than the period of the lower frequency signal but greater than the period of the higher frequency signal, said timer having a "preset" input;
latch means which when set indicate said first waveform;
first circuit means interconnecting said latch and said timer adapted to clear said latch each time said timer counts down to zero;
second circuit means interconnecting said latch and said

detecting circuit output whereby said output pulses set said latch;

third circuit means interconnecting said detecting circuit output and said timer "preset" input; and

means for excluding pulses having a time duration of less than a preselected time from setting said latch comprising:

a second latch loaded by said timer when the pulse train from said detector circuit is low and which remembers the previous timer value when said pulse train is high;



an adder connected to the output of said timer and adapted to add to said timer output an amount equal to said preselected timer duration;

and comparator means having a positive input connected to said second latch and a negative input connected to said adder, the output of said comparator means connected to said latch "set" input.

4,390,844

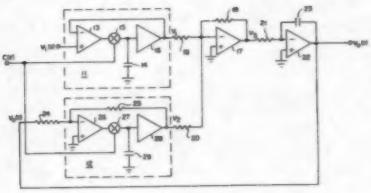
INTEGRATION FILTER FOR STEP WAVEFORMS

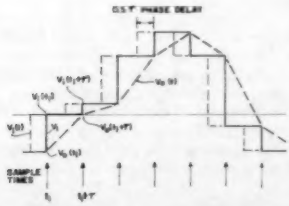
Joseph W. Ting, Culver City, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Dec. 24, 1980, Ser. No. 219,825

Int. Cl.³ H03K *4/90, 6/00*

U.S. Cl. 328—142 **7 Claims**





1. A method for smoothing a multistep waveform of an electrical signal by converting each step thereof into a perfectly linear segment over the next step period, each segment extending from the voltage at the end of the preceding step to the voltage at the beginning of the next step whereby said linear segment for each step has a potential difference between its beginning and its end voltages equal to the step change in potential.

4,390,845

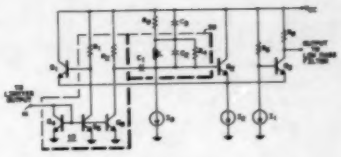
GATED QUADRATURE DETECTOR BIASED TO SWITCH ON SINUSOIDAL ZERO CROSSINGS

Lawrence P. Strickland, Tamarac, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1980, Ser. No. 213,762

Int. Cl.³ H03D *3/22;* H03K *9/06*

U.S. Cl. 329—103 **3 Claims**



1. A quadrature detector, comprising:

an input driver including a current mirror circuit receiving an input train of variable frequency waves for developing first and second outputs;

a phase-shift network receiving the first output of the input driver for developing a phase-shifted output;

a gating circuit comprising a plurality of transistors forming an OR gate responsive to the phase-shifted output of the phase-shift network and the second output of the input driver; and

a biasing circuit, including a resistor coupled between a voltage source and the phase-shift network and an active current sink coupled to the phase-shift network, for applying a DC bias to the output of the phase-shift network and to the gating circuit so that the gating circuit switches on those zero crossings of the output of the phase-shift network which are induced by frequency changes associated with the input train of waves.

4,390,846

POWER AMPLIFIER CONNECTION

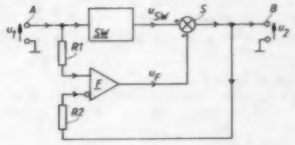
Gunnar Cragfors, and Jörgen Bosson, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Jan. 21, 1981, Ser. No. 226,995

Claims priority, application Sweden, Jan. 28, 1980, 8000633

Int. Cl.³ H03F *3/68*

U.S. Cl. 330—10 **5 Claims**



1. A power amplifier connection for converting an AC input signal into an amplifier AC output signal, said connection comprising:

a constant amplitude pulse width modulated switching amplifier providing a first output signal,

a proportional amplifier providing a second output signal,

means for summing said first and second output signals to form said amplifier AC output signal,

means for controlling said switching amplifier in dependence on said input signal to the amplifier connection so that said amplifier AC output signal substantially follows said input signal, and

means for controlling said proportional amplifier in dependence on the deviation between said AC input signal and said AC amplified output signal.

4,390,847

MUTING DEVICE

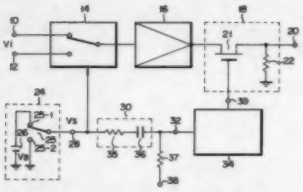
Hisashi Yamada, Yokohama, and Tsutomu Sugawara, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 3, 1980, Ser. No. 203,497

Claims priority, application Japan, Nov. 20, 1979, 54/149529

Int. Cl.³ H03G *3/34*

U.S. Cl. 330—51 **12 Claims**



1. A muting device comprising:

a signal-generating means for generating a switching operation changeover signal, said signal-generating means including DC power source means for having a predetermined DC voltage and for producing a DC current and switch means for receiving the DC current and for selectively generating the DC current at the output terminal thereof to produce said switching operation changeover signal;

changeover switching means connected to the output terminal of said switch means, for selectively transmitting one of a plurality of data signals in response to said switching operation changeover signal;

differentiation means connected to the output terminal of said switch means of said signal-generating means, for differentiating said switching operation changeover signal, said differentiation means including a single differentiation circuit for producing a differentiation signal having the positive and negative differentiated waveform components;

control circuit means having a single input terminal connected to the differentiation circuit of said differentiation means, for detecting whether a voltage level of said differentiation signal falls outside a predetermined voltage range and for generating a control signal when the voltage level at said negative differentiated waveform components is lower than a first voltage level which defines a minimum level of said voltage range or when the voltage level at said positive differentiated waveform components is higher than a second voltage level which defines a maximum level; and

muting switching means connected to said control circuit means, for attenuating said data signal selectively transmitted by said changeover switching means in response to said control signal from said control circuit means.

4,390,848

LINEAR TRANSCONDUCTANCE AMPLIFIER

Robert A. Blauschild, Los Altos, Calif., assignor to Signetics, Sunnyvale, Calif.

Filed Feb. 12, 1981, Ser. No. 233,911

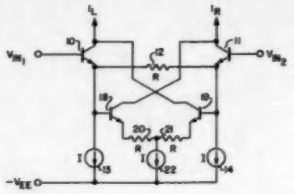
Int. Cl.³ H03F *1/02, 3/45*

U.S. Cl. 330—151 **15 Claims**

1. A self-biasing linear transconductance amplifier, which comprises:

a differential transconductance amplifier stage having a first bipolar transistor with first emitter, base and collector zones and a second bipolar transistor with second emitter, base and collector zones, said first and second base zones comprising the differential voltage input terminals of said linear transconductance amplifier and said first and second collector zones comprising the differential current output terminals of said linear transconductance amplifier;

a differential correction amplifier stage having first and second input terminals and first and second output terminals, said first and second input terminals being directly connected, respectively, to said first and second emitter



zones of said first and second bipolar transistors and said first and second output terminals being connected, respectively, to said second and first collector zones of said second and first bipolar transistors; and

means for establishing the relative gain of said correction amplifier stage with respect to the gain of said transconductance amplifier stage such that the nonlinearities generated in such transconductance amplifier stage are substantially cancelled by the nonlinearities generated in said correction amplifier stage.

4,390,849

AUDIO POWER AMPLIFIER WITH CLASS-D PUSH-PULL OUTPUT STAGE

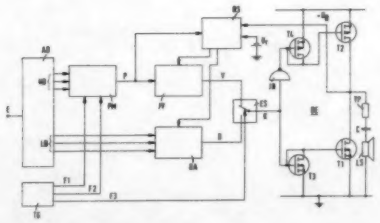
Leslie Miskin, Gundelfingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,490

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017414

Int. Cl.³ H03F *3/217, 3/38, 3/68*

U.S. Cl. 330—251 **1 Claim**



1. Audio power amplifier with class-D push-pull output stage, characterized by the following features:

the input stage is an analog-to-digital converter (AD) which provides a binary-coded output signal;

the low-order bits (LB) of the output signal of the analog-to-digital converter (AD) are applied to the input of a digital-to-analog converter (DA), and the other, high-order digits (HB) are applied to the input of a pulse-width modulator (PM);

the output signal (P) of the pulse-width modulator (PM) is applied to a pulse amplifier (IV) whose gain is adjusted by a control signal from a gated control stage (RS) in such a way that the amplitude of the output signal (V) of the pulse amplifier (IV) is equal to the maximum amplitude of the output signal (D) of the digital-to-analog converter (DA);

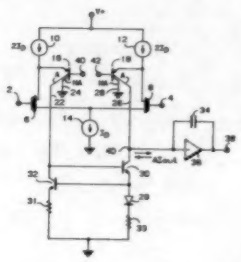
via an electronic changeover switch (ES), the output signal (D) of the digital-to-analog converter (DA) is added to the output signal (V) of the pulse amplifier (IV) between every two of the output pulses of the pulse amplifier (IV); this combination signal (K) and the signal inverse thereto each control one of the two halves (T1, T3; T2, T4) of the class-D push-pull output stage, each of which contains a VMOS or DMOS transistor (T1, T2) operated in constant-current mode outside the saturation region, and the control signal for the gain of the pulse amplifier (IV) and the reference voltage of the digital-to-analog converter (DA) are generated by the control stage (RS), which is gated by the output signal of the pulse-width modulator (PM) and compares the drain-source voltages of the series-connected VMOS or DMOS transistors (T1, T2) with a voltage reference (U_r) so that these transistors are operated outside their saturation region.

4,390,850

OPERATIONAL AMPLIFIER HAVING IMPROVED SLEW RATE/BANDWIDTH CHARACTERISTICS

William F. Davis, Tempe, and Stuart B. Shacter, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 16, 1981, Ser. No. 244,445
Int. Cl.³ H03F 3/45
U.S. Cl. 330—253 **8 Claims**



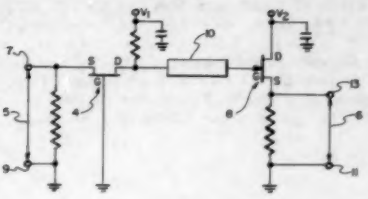
1. An amplifier having first and second stages, comprising:
first and second field-effect-transistor input devices adapted to receive first and second input signals;
a first current source coupled to said first input device for supplying current thereto;
a second current source coupled to said second input device for supplying current thereto;
first and second current splitting means coupled to said first and second input devices respectively and to said first and second current sources respectively for splitting current supplied thereto by said first and second current sources respectively; and
current mirror means coupled between said first and second current splitting means and coupled to said second stage for supplying current to said second stage when said first input device is on and said second input device is off and for receiving current from said second stage when said second input device is on and said first input device is off, said first current splitting means comprising transistor means having an emitter coupled to said first current source, a first collector coupled to said current mirror means, a second collector adapted to be coupled to a first source of voltage and having a base electrode adapted to be coupled to a bias potential, said first and second collectors being of different area.

4,390,851

MONOLITHIC MICROWAVE AMPLIFIER HAVING ACTIVE IMPEDANCE MATCHING

J. Aiden Higgins, Westlake Village, and Aditya K. Gupta, Newbury Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 25, 1980, Ser. No. 210,455
Int. Cl.³ H03F 3/16
U.S. Cl. 330—277 **5 Claims**



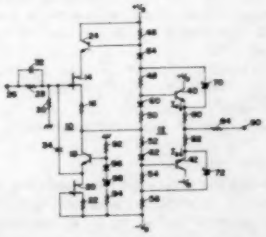
1. A monolithic microwave amplifier comprising:
an input port having a signal input terminal and an input ground terminal;
an output port having a signal output terminal and an output ground terminal;
a first field effect transistor having a source coupled to said signal input terminal, a gate, and a drain which is positively biased with respect to said source of said first field effect transistor;
an interstage matching network having its input end connected to said drain of said first field effect transistor;
a second field effect transistor having a gate connected to the output end of said interstage matching circuit, a source coupled to said signal output terminal, and a drain which is positively biased with respect to said source of said second field effect transistor;
said input ground terminal, said gate of said first field effect transistor, said drain of said second field effect transistor and said output ground terminal, all being connected in common.

4,390,852

BUFFER AMPLIFIER

John L. Addis, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 13, 1981, Ser. No. 253,471
Int. Cl.³ H03F 3/16, 3/26
U.S. Cl. 330—300 **5 Claims**



1. A buffer amplifier, comprising:
a source follower input stage comprising a field-effect transistor having a gate connectable to a signal source;
a complementary emitter follower output stage comprising an emitter-coupled pair of transistors wherein the bases thereof are coupled to the source of said field-effect transistor;
bias means for providing a substantially constant bias current

for said emitter-coupled pair of transistors, said bias means including first means for bootstrapping the emitters of said emitter-coupled pair of transistors; and

second means for bootstrapping the drain of said field-effect transistor,

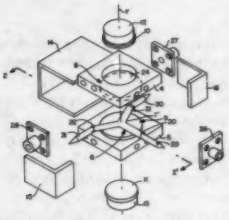
wherein both of said first and second bootstrapping means are driven by the output of said source follower input stage.

4,390,853

MICROWAVE TRANSMISSION DEVICES COMPRISING GYROMAGNETIC MATERIAL HAVING SMOOTHLY VARYING SATURATION MAGNETIZATION

Moni G. Mathew, and Thomas J. Weisz, both of Sunnyvale, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 139,815, Apr. 14, 1980, abandoned.
This application Aug. 12, 1981, Ser. No. 292,202
Int. Cl.³ H01P *1/387, 1/36, 1/218*
U.S. Cl. 333—1.1 **22 Claims**



1. A microwave transmission device comprising,

a first conductor disposed in a first plane,

a second conductor disposed in a second plane in parallel relation and spaced from said first conductor for transmitting electromagnetic energy in a single TEM mode with other modes suppressed,

a first body including a first gyromagnetic material adapted to be magnetized by a magnetic field and disposed between said first and second conductors, said body having a smoothly varying saturation magnetization in a direction parallel to said first plane for providing broad bandwidth operation for said device, said saturation magnetization varying as a function of position in a plane parallel to said first plane.

4,390,854

BROAD BANDWIDTH SURFACE ACOUSTIC WAVE FILTER APPARATUS WITH STAGGERED TUNING

Roger D. Colvin, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

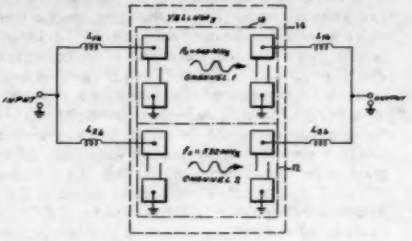
Filed Mar. 3, 1981, Ser. No. 239,955
Int. Cl.³ H03H *9/64, 9/145*
U.S. Cl. 333—193 **10 Claims**

1. A broad bandwidth filter apparatus comprising in combination:

a piezoelectric substrate;

a plurality of surface acoustic wave transducer pairs deposited upon said piezoelectric substrate, each transducer pair of said plurality of surface acoustic wave transducer pairs comprise an input transducer and an output transducer, each transducer pair operating at a predetermined center frequency, each transducer pair comprising a signal channel, and,

a separate tuning means for each of said plurality of surface acoustic wave transducer pairs, each transducer pair having a tuning means connected to its input transducer and to its output transducer, said tuning means for tuning said plurality of surface acoustic wave transducer pairs above and below its center frequency, all tuning means for said input transducers connected together to receive an input



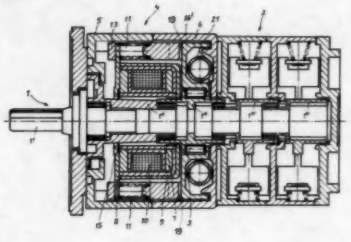
signal, all tuning means for said output transducers connected together to provide an output signal.

4,390,855

RESETTING DEVICE FOR MANUALLY OPERABLE ROTARY SWITCH

Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Ascona, Switzerland

Filed Aug. 24, 1981, Ser. No. 295,492
Claims priority, application Austria, Sep. 25, 1980, 4802/80
Int. Cl.³ H01H *9/00, 67/02*
U.S. Cl. 335—166 **7 Claims**



1. In combination: a rotary switch comprising a drive shaft manually rotatable about an axis thereof for rotation from a starting to a selected switching position; and a resetting device for resetting the switch to the starting position when a supply voltage falls below a predetermined limiting value, the resetting device comprising

(a) an electromagnet arranged coaxially on the drive shaft and connected to the supply voltage, the electromagnet having an armature movable into a retracted position in response to a supply voltage above the limiting value when the drive shaft is in the selected switching position,

(b) a restoring mechanism loaded by a return spring to return the switch drive shaft to the starting position, the armature of the electromagnet being arranged for selectively releasing the restoring mechanism when the supply voltage is below the limiting value in the selected switching position of the drive shaft,

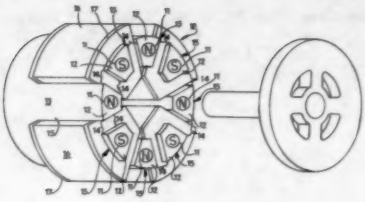
(c) a blocking tappet axially slidable in relation to the drive shaft and movable for blocking the restoring mechanism in the retracted position of the armature, and

(d) cooperating blocking means on the restoring mechanism and blocking tappet, the blocking means including complementary projecting and recess elements extending in the direction of the axis and adapted to interengage when the armature is in the retracted position and the rotary switch is in the switching position.

4,390,856
MULTIPOLE SOLENOIDS

Michael M. Schechter, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1981, Ser. No. 289,008
Int. Cl.³ H01F 7/09
U.S. Cl. 335—256 15 Claims



RING-SHAPED MULTIPOLE SOLENOID

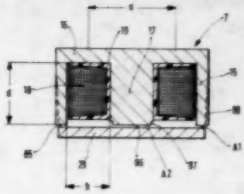
1. An electromagnetic device comprising:
a stator means having a plurality of pole means;
an armature means positioned adjacent said stator means for activation by said stator means and being movable with respect to said stator means;
an air gap positioned between said stator means and said armature for passing a magnetic flux, said air gap having a size dependent upon the relative positions of said stator means and said armature; and
induction coil means associated with alternating pole means for carrying an electric current and establishing a magnetic flux in a first direction in said associated pole means and a magnetic flux in a second direction in said pole means adjacent said associated pole means, thus forming magnetic poles of opposite polarity at the extremities of adjacent pole means, said induction coil means being adapted to carry an electric current so that at each instant during travel of said armature means the magnitude of the electric current is substantially that required to maintain the magnetic flux density in said air gap at saturation level, the electric current in said induction coil means rising relatively fast upon initial relative movement to a relatively high magnitude so that saturation magnetic flux density is achieved after a relatively small amount of travel of said armature means, the electric current decreasing from said relatively high magnitude as a function of the reduction in said air gap; and
all of said induction coil means being substantially identical with one another, having substantially identical electrical time constants and producing substantially identical magnetic traction forces, the total traction force of said electromagnetic device being substantially equal to the sum of forces of all of said induction coil means and the electric time constant of said electromagnetic device being substantially equal to the time constant of a single induction coil means associated with a single pole means.

4,390,857
ELECTROMAGNET

Hans Kubach, Korntal-Münchingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 326,090
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046891
Int. Cl.³ H01F 7/08
U.S. Cl. 335—282 6 Claims

1. An electromagnet for controlling a fuel injection valve for internal combustion engines, having a magnetic circuit which includes:
a ferromagnetic shell core having a window surface area A; an armature;
a magnetic winding, applied within the shell core, having an ohmic resistance R, a predetermined number of windings W, a fill factor K_L, and a window fill factor K_F, wherein



the magnetic winding is comprised of a wire which as a specific resistance S_L and a winding length l_m; and
wherein the magnetic circuit is dimensioned according to the formula

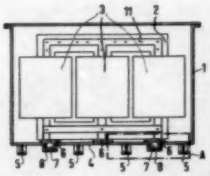
$$R = \frac{\rho_L \cdot l_m \cdot W^2}{A \cdot K_L \cdot K_F}$$

such that the quotient A/l_m is selected to be as small as possible.

4,390,858
LIQUID-COOLED TRANSFORMER FOR LARGE POWER RATINGS

Odilo Schulzer, Erlangen, Fed. Rep. of Germany, assignor to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,816
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012449
Int. Cl.³ H01F 27/02
U.S. Cl. 336—92 13 Claims



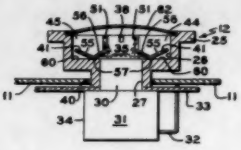
1. Liquid-cooled transformer for large power ratings, comprising tank having a bottom, large-area base plates resting on said tank bottom, an active part and a pressure device fastened to said base plates, a plurality of separate cups disposed in said tank bottom, hardenable liquid synthetic resin filling said cups, a plurality of posts being supported by and projecting downward from said base plates in direction of said tank bottom, each of said posts being immersed in a respective one of said separate cups for horizontally locking said active part relative to said tank bottom.

4,390,859

ELECTRIC THERMOSTAT WITH ADJUSTING KNOB

Donald J. Kasprzyk, Minn.; David A. Margenau, both of Maple Grove, and Marvin D. Nelson, St. Louis Park, all of Mo., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 9, 1981, Ser. No. 252,644
Int. Cl.³ H01C 7/02, 10/32
U.S. Cl. 338—25 8 Claims



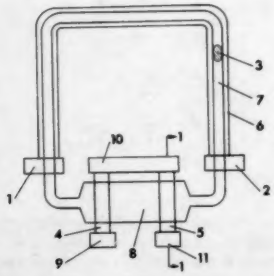
1. An electric thermostat, including: a housing to enclose and mount said thermostat; potentiometer means for setting an electrical value into said thermostat with said potentiometer means having a potentiometer body fixed in space within said thermostat; said potentiometer means further including a potentiometer shaft with said shaft being rotatable to adjust said potentiometer means to in turn set said thermostat; a knob having a hole with said hole being coaxial with said shaft to allow said knob to be placed over said shaft; said knob further including a cavity recessed into said knob with said shaft projecting into said cavity; clip means recessed in said cavity and formed of a single piece of resilient material; said clip means having an opening formed through said clip means with said opening normally being smaller than said shaft to allow a frictional engagement between said clip means and said shaft by said shaft passing through said opening in said clip means; and said clip means further having projection means being formed to allow said opening in said clip means to be biased against the natural resilience of said clip means to an enlarged size greater than said shaft to allow positioning said knob with respect to said shaft.

4,390,860

ELECTRONICALLY VARIABLE RESISTANCE DEVICE

Steven E. Garvey, 18288 Highway 9, Boulder Creek, Calif. 95006

Filed Jul. 23, 1981, Ser. No. 286,242
Int. Cl.³ H01C 10/02
U.S. Cl. 338—38 6 Claims



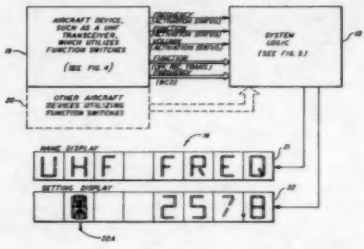
1. A variable resistance device comprising:
a channel having a continuous resistive portion isolated from a continuous conductive portion;
a moveable conductive liquid globule contained in said channel;
means for moving said globule in response to an electric current.

4,390,861

COCKPIT DISPLAY SYSTEM TO REDUCE VERTIGO

Edwin Cohen, Binghamton, N.Y., and Jack A. Maynard, Hallstead, Pa., assignors to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 90,764, Nov. 2, 1979, abandoned. This application Mar. 11, 1981, Ser. No. 242,742
Int. Cl.³ G08C 21/00, 23/00; G06F 3/14
U.S. Cl. 340—27 R 6 Claims



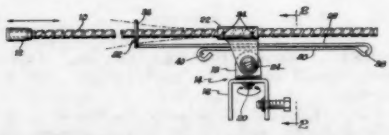
1. An anti-vertigo cockpit display system for preventing spatial disorientation by indicating, within a pilot's normal field of view, the identity and the setting of a plurality of predetermined functions controlled by separate control switch means located out of the pilot's normal field of view, comprising:
a single display means, for displaying a selected one of the functions, located within the pilot's normal field of view so that it may be viewed without it being necessary to turn the pilot's head,
the control switch means each having a single knob located out of the pilot's normal field of view,
system logic circuit means connected with each of said single knobs to energize said display means when a selected single knob is touched by the pilot's hand,
said display means being adapted to reveal both the entire present setting and the identity of the function connected with said selected single knob,
so that said pilot is informed without moving his eyes from his normal field of view, and
so that said present setting can be altered by adjusting said single knob of said control switch means.

4,390,862

PROXIMITY INDICATOR FOR MOTOR VEHICLES

William J. Elks, 1310 Cary Way, San Diego, Calif. 92109

Filed Apr. 16, 1981, Ser. No. 254,825
Int. Cl.³ B60Q 9/00; H01H 3/16
U.S. Cl. 340—61 6 Claims



1. A proximity indicator for a vehicle comprising:
(a) a mounting bracket defining a yoke;
(b) a feeler probe extending from said yoke and at least a portion of which is conductive;
(c) a ring contact having a shaft mounted in said yoke, said ring contact encircling said probe;

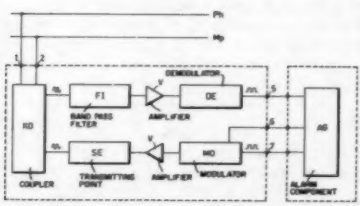
(d) both said ring contact shaft and said probe being longitudinally adjustable for sensitivity and proximity settings, respectively by virtue of a common adjustable yoke engaging same therebetween;
(e) an electric signal;
(f) a powered electric circuit defined through said signal, probe and ring such that it is closed when said probe contacts said ring, whereby deflection of said probe against said contact actuates said signal.

4,390,863

SYSTEM FOR THE TRANSMISSION OF BINARY SIGNALS BETWEEN THE COMPONENTS OF AN ALARM SYSTEM

Willi Merkel, Albstadt, Fed. Rep. of Germany, assignor to Fritz Fuss Kom.-Ges Elektrotechnische Fabrik, Albstadt, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,880
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923715
Int. Cl.³ H04B 3/54
U.S. Cl. 340—310 R **7 Claims**



1. A system for the transmission of binary signals having two logical conditions between the components of an alarm installation and across a transmission path including an external wire network, comprising:

converting means for converting each of the two logical conditions of said binary signals into respective signal frequencies,

coupling means for coupling the alarm installation to the external wire network,

clamping means for clamping the voltage level of both binary signals on the same amplitude, and providing the binary signals representing the two logical conditions with respective signal frequencies within the range of between 20 kHz and 500 kHz, said frequencies being separated from each other by less than 10 kHz, and

band pass filter means for detecting the respective signals frequencies said filter means comprising two linked parallel resonant circuits, one of said two linked parallel circuits being tuned to a first one of the two respective frequencies and another of said two linked parallel circuits being tuned to a second one of the respective frequencies, said band pass filter exhibiting a narrow band pass response characteristic which is symmetrical with respect to a band mean frequency of the two binary signals, and

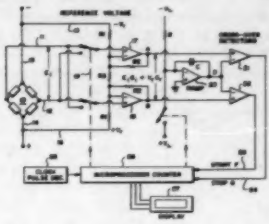
wherein the coupling means comprises a ferrite ring with three windings, including a first winding connected via two condensors with the external wire network, a second winding connected to the converting means, and a third winding connected to the band pass filter means.

4,390,864

ANALOG TO DIGITAL CONVERTER WITHOUT ZERO DRIFT

A. Newman Ormond, 12020 E. Rivera Rd., Santa Fe Springs, Calif. 90670

Filed May 11, 1981, Ser. No. 262,555
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 NT **6 Claims**



1. A method of converting an analog signal to a numerical count directly proportional to said analog signal without zero drift by utilizing equal and opposite reference voltages, including effecting a first conversion in accord with the following steps:

(a) utilizing a differential operational amplifier means including two operational amplifiers for adding said analog signal to said reference voltages to provide two first output voltage levels;
(b) generating a first ramp voltage of given slope;
(c) generating a series of constant frequency clock pulses;
(d) providing a counter for said clock pulses;
(e) starting and stopping said counter with first signals generated at points in time when said first ramp voltage crosses over said two first output voltage levels, respectively to define a first given number N1 of pulses;
(f) subtracting said analog signal from said reference voltages through said differential operational amplifier means to provide two second output voltage levels;
(g) generating a second ramp voltage of the same given slope as said first ramp voltage;
(h) starting and stopping said counter with second signals generated at points in time when said second ramp voltage crosses over said two second output voltage levels respectively to provide a second given number N2 of pulses; and,
(i) dividing N1−N2 by N1+N2 to provide said numerical count.

4,390,865

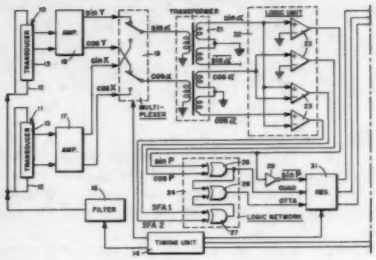
APPARATUS FOR DIGITAL POSITION MEASUREMENTS BY A CYCLIC POSITION TRANSDUCER

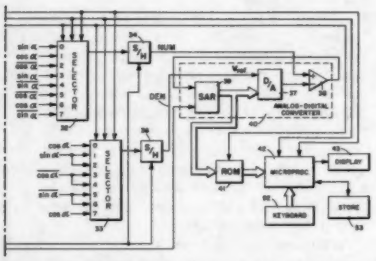
Luciano Lauro, Pavone Canavese, Italy, assignor to Olivetti Controllo Numerico S.p.A., Marcianise, Italy

Continuation of Ser. No. 68,382, Aug. 21, 1979, abandoned. This application May 28, 1981, Ser. No. 267,910
Claims priority, application Italy, Aug. 31, 1978, 69013 A/78
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 SY **3 Claims**

1. An apparatus for digital position measurements, comprising a precision transducer having a stationary scale provided with a single zig-zag circuit, the transverse conductors of which are located at a predetermined elementary interval, and a cursor provided with a pair of windings, one out of phase with respect to the other by a quarter of said interval, said zig-zag circuit being supplied with a sinusoidal signal to cause said windings to generate as outputs a pair of signals proportional to the sine and cosine of the electric angle corresponding to the position of measurement within one interval, a circuit for supplying the complementary signals of said pair of signals,

comparator means responsive to said pair of signals and said complements for producing two pairs of square waves, the waves of each pair being mutually distanced 90 degrees, one of the waves of one pair being distanced from one wave of the other pair 45 degrees, a logic network combining said square waves for producing a quadrant wave and an octant wave of the positions indicated by said transducer, within one interval, a register responsive to one of said square waves and to said quadrant and octant of said angle, a pair of multiplexers each one having an output connected to a corresponding sample hold circuit, said multiplexers being responsive to the digital code so memorized to select, according to the octant, two signals among said pair of signals and said complementary signals for causing said sample hold circuits to generate octant





continuous voltages representative of the analog value of the numerator and denominator of a fraction less than 1, thus selectively indicating the absolute value of the tangent and the contangent of said electric angle, converting means for converting said absolute value into a digital value, said converting means including a digital analog converter having as a reference the value of said denominator, a comparator between said numerator and the output of said converter and a counter incremented by said comparator for supplying a digital input to said converter, whereby said digital value is obtained by successive approximations, and a read only memory addressed by the digital value so obtained and by at least part of the digital code of said register for directly indicating the position of said cursor in said interval.

4,390,866

KEYBOARD WITH ELECTRONIC HYSTERESIS

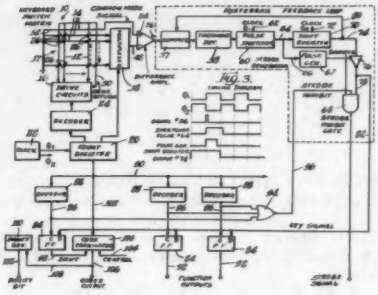
Keith A. Engstrom, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 457,884, Apr. 4, 1974, which is a division of Ser. No. 339,476, Mar. 8, 1973, abandoned, which is a continuation of Ser. No. 144,902, May 19, 1971, abandoned. This application Feb. 19, 1981, Ser. No. 235,374

Int. Cl.³ G11C *19/00*

U.S. Cl. 340—365 E **18 Claims**

1. A keyboard comprising a plurality of selectively operable matrix elements each having an actuated state and an unactuated state, output means for scanning and sensing the state of each of said matrix elements in a sequential cyclic manner, memory means coupled to said output means for temporarily storing the sensed state of each of said matrix elements, said output means comprising a level detection means coupled to said matrix elements and to said memory means for ensuring the validity of said states sensed by said output means and feedback means coupled to said memory means for transmitting a feedback signal representative of the state that the matrix



element being scanned was in during the previous scan cycle, said level detection means being constructed to respond to said feedback signal so as to provide a first signal level upon which said sensed state of a scanned matrix element is superimposed when said feedback signal is representative of an unactuated state of said scanned matrix element and a second signal level upon which said sensed state of a scanned matrix element is superimposed when said feedback signal is representative of an actuated state of said scanned matrix element.

4,390,867

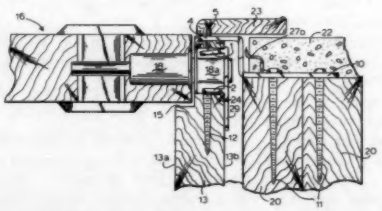
BURGLAR ALARM SYSTEM

James Queren, 218-07 43rd Ave., Bayside, N.Y. 11361

Filed Aug. 3, 1981, Ser. No. 289,373

Int. Cl.³ G08B *13/06*

U.S. Cl. 340—542 **7 Claims**



1. A burglar alarm system mounted in a reinforced doorway framing which comprises a wooden door jamb having two substantially parallel major faces and two minor faces substantially perpendicular to the major faces, one of the major faces having a recessed end portion delimited by one of the minor faces and a shoulder constituting a stop for a door, and the door jamb defining a door latch bolt hole in the recessed end portion, a wall including wooden wall stud means adjacent the other major face of the door jamb, the other major face and the wall defining a narrow space therebetween, the door jamb being mounted on the wall and the minor faces of the door jamb extending substantially parallel to the wall, a reinforcement metal plate extending over a substantial portion of the wall stud means and a substantial portion of the one minor face of the door jamb, the reinforcement plate being securely af-

fixed to the wall stud means and the one minor face of the door jamb and covering a substantial region of the minor door jamb face adjacent and beyond the door latch bolt hole, the securely affixed plate holding the door jamb firmly in position, a striker plate defining a hole registering with the bolt hole and mounted thereover on the jamb, an electrically conductive rigid backer plate arranged in the narrow space in contact with the other major face of the door jamb and in registry with the striker plate, the backer plate having a predetermined electrical polarity and defining a hole registering with the hole in the striker plate, whereby a long latch bolt may be projected from the door into the latch bolt hole through the holes in the striker and backer plates, and fastening elements securing the striker and backer plates to the door jamb, the fastening elements passing through the jamb between the striker and backer plates whereby the door jamb is sandwiched between the striker and backer plates, and the burglar alarm system comprising a burglar alarm and an electrical control circuit connected to the burglar alarm and energizable to set off the alarm, the circuit having a normally open switch point consisting of a flange projecting from the backer plate towards the striker plate slightly recessed from the hole in the striker plate and slightly inclined towards the striker plate hole whereby the backer plate flange is out of contact with, but close to, the long latch bolt projected into the latch bolt hole for locking the door, and a contact element having an electrical polarity opposite to the electrical polarity of the backer plate, the contact element being mounted in the reinforcement plate and extending towards, but being normally slight spaced from, the flange whereby the switch point is open and the control circuit is not energized, displacement of the projected latch bolt towards the flange by a burglar tool and resultant displacement of the flange towards the contact element causing the flange to touch the contact element and energize the control circuit to set off the alarm.

4,390,868

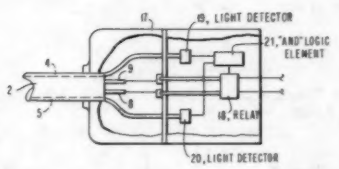
SECURITY OF MANUFACTURED APPARATUS

Richard L. Garwin, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,933

Int. Cl.³ G08B *13/00, 13/18, 13/24*

U.S. Cl. 340—568 **9 Claims**



1. A power cord of the type that delivers electrical power from a disconnectable source to a power-dependent apparatus the improvement comprising:

at least two power delivery conductors;

at least one signal bearing member of the type capable of transmitting at least one of optical and electrical signals; positioned visibly along the length of, insulated from, and contiguous with said power delivery conductors;

electrical-to-optical signal transducer means located at, at least one of said disconnectable source and said apparatus and operable to provide a light signal through said signal bearing member; and

optical-to-electrical signal transducer means at the other of said at least one of said disconnectable source and said apparatus responsive to said light signal; and indicating continuity conditions along said power cord.

4,390,869

GAS SENSING SIGNALING SYSTEM

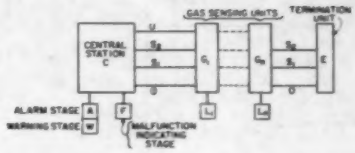
Peter Christen, Männedorf, and Peter Müller, Oetwil, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Continuation-in-part of Ser. No. 54,786, Jul. 5, 1979, abandoned. This application Jan. 14, 1981, Ser. No. 225,097

Claims priority, application Switzerland, Jul. 17, 1978, 7721/78

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—632 **44 Claims**



1. Gas sensing system having

a plurality of gas sensing units ($G_1 \ldots G_n$), each sensing unit including

a gas sensor (1) providing a sensing output signal (1′, 1*a*, 1*b*) upon sensing presence of a gas to which the gas sensor is responsive;

threshold level means (2,3) responsive to said sensing output signal having at least two threshold levels (low, high) and providing respective low level and high level output signals (2*a*, 3*a*) upon sensing gas concentration exceeding a lower level, or exceeding a higher level, respectively;

a low level signal processing stage (6);

and a high level signal processing stage (7),

said signal processing stages being respectively connected to said threshold level means and responsive to the respective low level and high level output signals (2*a*, 3*a*);

a central station (C);

connecting cable means (U, S_1, S_2, O) interconnecting the central station (C) and the gas sensing units ($G_1 \ldots G_n$) for signal transfer between said central station and said units,

said central station (C) including

a warning stage (W);

an alarm stage (A);

a low level input signal analyzing stage comprising

a warning signal timing stage (11) establishing a warning signal time interval;

a warning signal input circuit (10) and warning signal transfer means responsive to the low level signal (2*a*) over said connecting cable means and activating said warning signal timing stage (11);

a warning signal self-holding circuit operative if the low level signal (2*a*) persists for the timing duration of said warning signal timing state (11) for then activating said warning stage (W);

and a high level signal analyzing stage comprising

an alarm signal timing stage (31) establishing an alarm signal time interval which is shorter than the warning signal time interval;

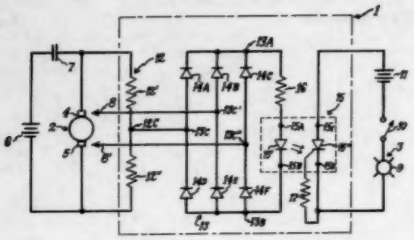
an alarm signal input circuit (30) and alarm signal transfer means responsive to the high level signal (3*a*) over said connection cable means and activating said alarm signal timing stage (31);

and an alarm signal self-holding circuit operative if the high level signal (3*a*) persists for the timing duration of said alarm signal timing stage (31) for then activating said alarm stage (A).

4,390,870
INTERFACE CIRCUIT FOR BRUSH WEAR INDICATOR APPLICATION

Richard N. Michael, McKean, Pa., assignor to General Electric Company, Research Triangle Park, N.C.

Filed Jun. 15, 1981, Ser. No. 273,555
Int. Cl.³ G08B 21/00; H02H 7/08
U.S. Cl. 340—648 6 Claims



1. An interface circuit for use between a brush wear indicating circuit and a plurality of brush wear sensors that are each operable respectively, to transmit or produce an electrical signal responsive to the occurrence of a predetermined degree of wear of an associated brush, comprising;

a resistor bridge circuit having a midpoint voltage connection;

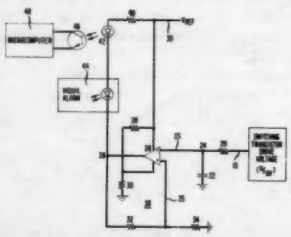
a diode bridge circuit having a plurality of input connections and a pair of output connections, one of said input connections being electrically connected to the midpoint voltage connection of said resistor bridge, and each of the other input connections being connectable, respectively, to receive signals from one of said plurality of brush wear sensors,

and a photon coupled isolator having input terminals electrically connected, respectively, to the output connections of said diode bridge and having output terminals electrically connectable to transmit a signal to an indicating means responsive to actuation of the photon coupled isolator.

4,390,871
CIRCUIT FOR DETECTING REDUCTION IN POWER

Michael W. Andrews, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1981, Ser. No. 258,678
Int. Cl.³ G08B 21/00
U.S. Cl. 340—659 9 Claims



1. A method for providing a control signal indicating a reduction in power delivered to the input of a DC-DC converter

characterized by the steps of

averaging the voltage levels of the drive pulses to a switching transistor in said converter,

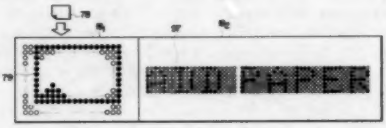
comparing said average drive pulse voltage level with a threshold voltage level (14), and

generating a control signal (42,46) when said average drive pulse voltage level exceeds said threshold voltage level.

4,390,872
DOT MATRIX CONDITION DISPLAY DEVICE FOR PHOTOCOPIERS

Reiji Murakami, 1438 Nishiterao, Kanagawa-ku, Yokohama-shi, and Shunichi Nakajima, 408 Kishine-cho, Kohoku-ku, Yokohama-shi, both of Japan

Filed Apr. 27, 1981, Ser. No. 257,620
Claims priority, application Japan, Apr. 30, 1980, 55/58346
Int. Cl.³ G08B 21/00
U.S. Cl. 340—679 7 Claims



1. A display device for a photocopier for detecting various troubles of the photocopier by a detector and for displaying these troubles, comprising:

(a) display means for simultaneously displaying both symbol marks corresponding to various troubles of said photocopier and display phrases representing the meanings of said symbol marks;

(b) pattern generating means for electronically storing pattern signals representing said symbol marks and said display phrases;

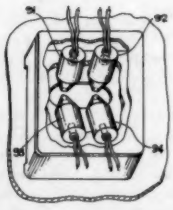
(c) control means for receiving at least one detection signal from said detector and for outputting a control signal to read out from said pattern generating means said pattern signals representing said symbol mark and said display phrase corresponding to said detection signal; and

(d) display driving means for receiving said pattern signals and for driving said display means in accordance with said pattern signals read out from said pattern generating means to display said corresponding symbol mark and said display phrase.

4,390,873
ELECTRONIC MOUSE

Steven T. Kirsch, 655 S. Fairoaks Ave., Apt. D313, Sunnyvale, Calif. 94086

Filed May 18, 1981, Ser. No. 264,478
Int. Cl.³ G08B 5/36
U.S. Cl. 340—710 19 Claims



1. A position control system for a cursor or the like comprising,

a surface having a repetitive pattern of passive, position-related contrasting indicia extending over the surface, the

indicia defining position states in two directions at the same locations,

detector means comprising a four-quadrant detector movable over the surface for sensing said passive indicia and generating an electrical signal representing position states in response thereto, and

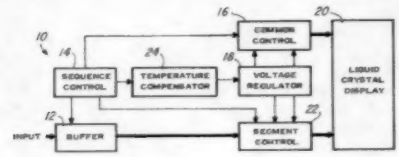
electrical memory means connected to the detector means for noting changes in said electrical signal and converting said changes to digital signals in position registers for a cursor or the like.

4,390,874

LIQUID CRYSTAL DISPLAY SYSTEM HAVING IMPROVED TEMPERATURE COMPENSATION

Robert H. Woodside, Lubbock, Tex., and Michael J. Drury, Ft. Collins, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 9, 1981, Ser. No. 223,664
Int. Cl.³ G09G 3/18
U.S. Cl. 340—812 **20 Claims**



1. A liquid crystal display system comprising:

a liquid crystal display segment;

a display drive means for alternatively coupling said display segment to first and second voltages;

a capacitance ratio selection means, responsive to the temperature of said display segment, for selecting one of a plurality of predetermined ratio values, each predetermined ratio value corresponding to one of a plurality of temperature ranges; and

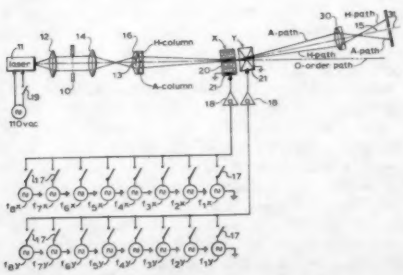
a temperature compensation means for determining the ratio of the capacitance of said display segment when coupled to said first voltage to the capacitance of said display segment when coupled to said second voltage, and for changing said second voltage to converge said ratio to said selected predetermined ratio value.

4,390,875

MESSAGE CHARACTER IMAGE PROJECTION CONTROL SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 201,179, Oct. 27, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 359,135
Int. Cl.³ G08B 5/36
U.S. Cl. 340—815.27 **2 Claims**



1. In a message character image projection control system including an array of character shaped light forming window means, a source of light and means for exposing the window means of said array to light from said source, and optical means positioned along an optical axis of said system for establishing individual optical path relationships between each said window means of the array and said optical axis, wherein the improvement comprises:

(a) said optical means including first and second acousto-optic optical path relationship control means and each of said control means including an ultrasonic frequency transducer and an interaction medium positioned along said optical axis, and a source of ultrasonic frequency voltages and circuit means for connecting said transducers to this source of voltages for an establishing of any of a number of different acoustic wave light reflecting conditions within the interaction medium of said first control means and within the interaction medium of said second control means, each said optical path relationship corresponding, respectively, to a combination of said light reflecting conditions of said first and second control means;

(b) means for establishing a predetermined one of said light reflecting conditions within said medium of the first control means and a predetermined one of said light reflecting conditions within said medium of the second control means and establishing a corresponding one of said optical path relationships between a predetermined one of the window means of said array and said optical axis;

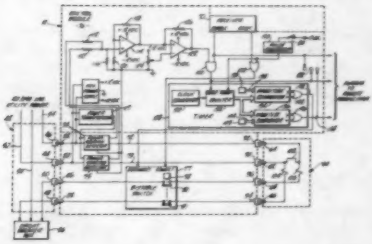
(c) said exposing of the window means of said array to light from said source including a flooding of the entire array of said window means, simultaneously, with light from said source of light, said flooding of the entire array of window means allowing a viewing of an optical image of said predetermined one of the window means from along said optical axis.

4,390,876

ELECTRIC UTILITY DEMAND LIMITING DEVICE AND METHOD

Glenn J. Bjorklund, Santa Ana, and Charles E. Phillips, Alhambra, both of Calif., assignors to Southern California Edison Co., Inc., Rosemead, Calif.

Filed Jul. 25, 1980, Ser. No. 172,251
Int. Cl.³ H04Q 9/00; H02J 13/00
U.S. Cl. 340—825.17 **26 Claims**



1. An electrical power demand limiting device for controllably disconnecting a local load extraneous the device from a power source comprising

signal generating means for generating a first signal representative of the electrical power consumption of the load,

comparing means responsive to the signal generating means for comparing the first signal to a preset electrical power consumption limit,

receiving means for receiving a remote control signal from a power production source responsive to conditions at said power production source for providing an enable output in response thereto to enable the operation of the device,

disconnecting means responsive to the comparing means and to the enable output of the receiving means for discon-

necting the said extraneous local load entirely from the power source when the first signal exceeds the preset limit and when the receiving means has enabled the device, and

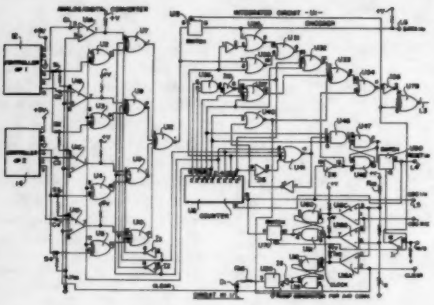
resetting means for resetting the disconnecting means to reconnect the local load to the power source such reconnected load being the entire initial load or a locally selected portion of said initial load.

4,390,877

REMOTE CONTROL SYSTEMS FOR TOY VEHICLES, AND THE LIKE

Kenneth J. Curran, 2080 Shady Brook Ct., Thousand Oaks, Calif. 91362

Filed Jul. 31, 1980, Ser. No. 174,037
Int. Cl.³ H04B 7/00; A63H 30/04; G06F 3/02
U.S. Cl. 340—825.72 **9 Claims**



1. A remote control system for an instrumentality to be controlled comprising: a controller for producing at least one analog control signal; analog/digital converter circuitry connected to the controller for converting the analog control signal into digital control signals representing at least one command to be transmitted to the instrumentality; encoding circuitry connected to the analog/digital converter circuitry for processing the digital control signals from the analog/digital converter circuitry into successive words containing binary coded bits representative of said digital control signals; cyclic signal generating circuitry connected to said controller for introducing a cyclic signal to said controller to cause said encoding circuiry to produce a predetermined number of such successive words for each cycle of said signal with the binary value of the binary coded bits in the words generated during each of the cycles being dependent upon the value of said analog control signal; and means connected to the encoding circuit for transmitting the successive words to the instrumentality.

4,390,878

TWO RECEIVER NOISE LOGGERS

John W. Harrell, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 2, 1981, Ser. No. 222,101
Int. Cl.³ G08C 19/00
U.S. Cl. 340—856 **10 Claims**

1. In a system for acoustic noise logging in a production well including:

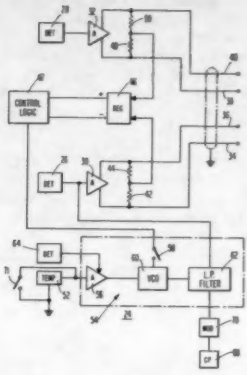
up-hole components,

down-hole components, the down hole components including at least two sonic detectors, said up-hole components and said down-hole components being linked together by four wire interconnecting means, the improvement comprising:

additional down-hole components including:

a first parameter detector, the output signal from which is a frequency proportional to a sensed first parameter;

a second parameter detector having a means for frequency modulating said signal in response to a sensed second parameter; and



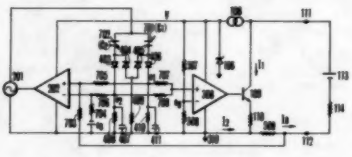
a third parameter detector having a means for amplitude modulating said signal in response to a sensed third parameter.

4,390,879

APPARATUS FOR CONVERTING PHYSICAL QUANTITIES

Atsushi Kimura, Yokohama, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,108
Claims priority, application Japan, Feb. 15, 1980, 55-17293
Int. Cl.³ G08C 19/10
U.S. Cl. 340—870.37 **7 Claims**



1. Apparatus for converting a physical quantity into an electrical signal representative of the quantity without error from changes in ambient conditions comprising:

a power source for supplying electrical power of said apparatus;

a detecting circuit means supplied with the output of said power source for detecting variations in a physical quantity to be measured, the electrical characteristics of said detecting circuit means being varied in accordance with changes in said physical quantity to be measured, and in accordance with changes in ambient conditions;

a reference electrical value;

a converting circuit means for amplifying a difference between a first electrical output of said detecting circuit means and said reference value, and for converting the amplified difference into an output of said apparatus;

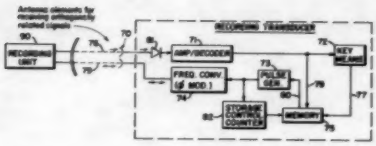
a negative feedback circuit means for feeding back a feedback signal which is a portion of said output of said apparatus to a control circuit means; and

said control circuit means for comparing a second electrical output of said detecting circuit means with said feedback signal, and for controlling the electrical power supplied by said power source in accordance with said comparison.

4,390,880
RADIO COMMUNICATION SYSTEM AND TRANSMITTER AND RECEIVER EQUIPMENT THEREFOR

Bengt Henoch, Skärholmen, Sweden, assignor to Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm, Stockholm, Sweden

Continuation-in-part of Ser. No. 828,031, Aug. 26, 1977, abandoned. This application Sep. 29, 1980, Ser. No. 191,501
Claims priority, application Sweden, Sep. 2, 1976, 7609732
Int. Cl.³ G01S *13/80*
U.S. Cl. 343—6.8 LC **8 Claims**



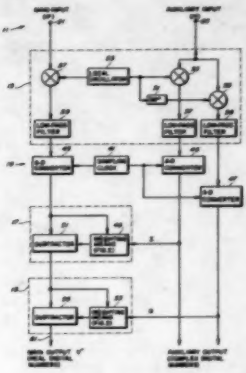
1. A system located at a first station to provide two-way radio communication with a second station wherein said second station is equipped to receive a radio signal and to transmit an interrogation radio signal and also an information-bearing radio signal having an information signal component and key signal component, said system comprising first means providing for the reception of said information-bearing signal but not said interrogation signal, second means for retrieving said information and key signal components from the information-bearing signal received by said first means, an electrically programmable read/write memory, third means for storing a preselected code, fourth means connected to said memory for enabling information to be written into and read out of said memory, said fourth means including a circuit for comparing the retrieved key signal component with said pre-selected code and for writing the information contained in said information signal component into said memory only if the retrieved key signal component corresponds to said code, fifth means for receiving said interrogation signal, but not said information-bearing signal and sixth means rendered effective upon the reception of said interrogation signal for transmitting the information stored in said memory in the form of a signal that is receivable by said second station.

4,390,881
REAL-DATA DIGITAL-REAL-WEIGHT CANCELER

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Laurel, both of Md., assignors to The United States of America as respresented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1982, Ser. No. 386,838
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 LE **10 Claims**

1. A real-data digital-real-weight canceler comprising:
input means for receiving a main channel signal having a bandwidth B, and for receiving an auxiliary channel signal which is correlated to the main channel signal;
converter means connected to the input means for mixing both the main channel signal, the inphase and quaduature components of the auxiliary channel signal, with a reference signal whose frequency is outside the frequency spectrum of the main channel signal;
digitizing means connected to the converter means for sampling the difference frequencies of the mixed signals at a rate of at least 2B and for converting the samples of the main channel signal to real digital numbers and the samples of the inphase and quadrature components of the auxiliary channel signal respectively to the real and imaginary parts of complex digital numbers;
first adaptive loop means for orthogonalizing the real digital numbers and the real part of the complex digital numbers; and

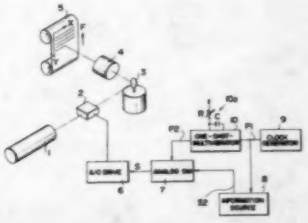


second adaptive loop means for orthogonalizing the real digital numbers and the imaginary part of the complex digital numbers.

4,390,882
DENSITY ADJUSTING METHOD IN IMAGE RECORDING

Yuji Ohara, and Kazuo Horikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 5, 1981, Ser. No. 318,538
Claims priority, application Japan, Nov. 11, 1980, 55/158516
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—1.1 **7 Claims**

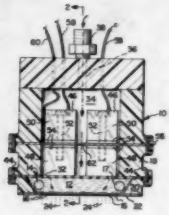


1. In a process of recording an image by scanning a recording material with a light beam modulated by an image signal, a method of adjusting the image density in the image recording which comprises the steps of; controlling the intensity of a light beam at predetermined intervals as a function of a clock pulse for obtaining picture elements of said image, recording a picture element only for a predetermined recording time within each said predetermined interval and not effecting recording of a picture element for the remainder of said predetermined interval, and adjusting the density of the entire recorded image by changing said predetermined recording time.

4,390,883
FLUID JET PRINT HEAD AND METHOD OF TERMINATING OPERATION THEREOF

Leonard G. Stoneburner, Richmond Dale, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 8, 1981, Ser. No. 300,146
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—75 24 Claims

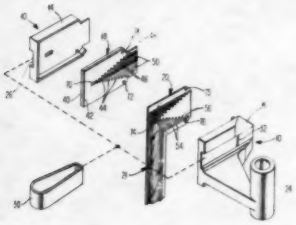


1. A fluid jet print head, comprising:
manifold means defining a fluid receiving reservoir, a fluid inlet communicating with said fluid reservoir, and at least one orifice communicating with said fluid reservoir,
means for supplying fluid through said fluid inlet to said fluid reservoir to produce a jet drop stream emanating from said orifice, and
inflatable means, cooperating with said manifold means, for expansion within said fluid reservoir to displace fluid therefrom and contact said manifold means so as to seal said orifice and terminate fluid flow through said orifice.

4,390,884
PRINTHEAD STYLUS ASSEMBLY

Steven L. Applegate, and Edward R. Lloyd, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,975
Int. Cl.[3] G01D 15/06
U.S. Cl. 346—139 C 14 Claims

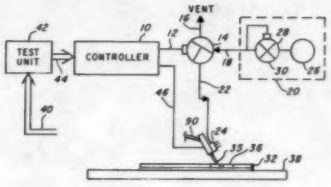


1. A stylus electrode insert for a printhead comprising:
a backing sheet of resilient compressable material;
a support layer extending over at least a portion of said backing sheet;
a set of spaced electrodes formed on said support layer and extending to a printing edge thereof;
a set of contact pads corresponding, respectively, to the electrodes of said set, which contact pads are staggered in a pattern characterized by an essentially uniform offset distances that are less than contact pad dimension in the direction of the offset; and
a set of conductors extending from said electrodes to connect with the respective of said contact pads at end sections thereof projecting as a result of said offset, whereby a compact connection arrangement is achieved.

4,390,885
APPARATUS AND METHOD FOR FLUID TRANSFER

Gautam N. Shah, Garland; Michael R. Brown, Plano; Edward C. Lee, Dallas; Gerald C. Hook, Garland; Robert L. Wand, Richardson; Charles R. Ratliff, Richardson, and Virge W. McClure, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1981, Ser. No. 277,584
Int. Cl.[3] G01D 15/18, 9/00
U.S. Cl. 346—140 R 10 Claims



1. A system for selectively applying a predetermined amount of ink to an individual item of a plurality of items forming a sheet thereof, comprising:
(a) a reservoir having an enclosed cavity for said ink with a first and second opening into said cavity;
(b) a pneumatic supply;
(c) a valve connected to said pneumatic supply, ambient air, and said first opening for selectively connecting said supply in response to a first signal to said ink and ambient air to said ink;
(d) an arm for selective movement of a first end thereof from a rest position to an inking position in response to a second signal;
(e) a tube having one end disposed through said second opening into said ink and another end opposite to said one end thereof attached to said arm for movement to a position closely adjacent to said item;
(f) a table having said sheet disposed thereon for positioning each item adjacent said ink position;
(g) a controller connected to said valve and said arm for producing said first signal for a known duration to expel said predetermined amount of ink from said cavity through said tube and initiating said second signal substantially simultaneously with said first signal.

4,390,886
INK JET PRINTING MACHINE

S. Bertil Sultan, Carrollton, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 25, 1981, Ser. No. 305,583
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—140 PD 6 Claims

1. An ink jet printing machine comprising:
an array of nozzles;
a plurality of channels for coupling a supply of writing fluid to each nozzle of said array;
a plurality of transducers, each of said transducers posi-

tioned closely adjacent an associated channel, so that activation of the transducer that is adjacent its associated channel ejects a droplet of writing fluid from the nozzle coupled to that channel;

one each of the nozzles, channels and transducers being supported in a housing of their own which, when abutted against other similar housings, forms said array of nozzles;

means for activating said transducers in the housings; and

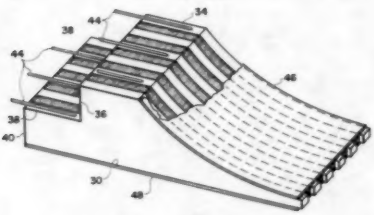
each said housing having recessed portions which define slots which are spaced between adjacent transducers and extending between adjacent channels to isolate each transducer and associated channel from the transducers and their associated channels in the other housings with which said housing abuts.

4,390,887

ELECTROGRAPHIC RECORDING STYLUS

William R. Chynoweth, Littleton, and Roger D. Erickson, Denver, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1980, Ser. No. 201,769
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—155 **8 Claims**



1. A stylus array for electrographic recording apparatus, said stylus array comprising:

a plurality of stylus elements, each of said stylus elements being formed of thin, flat electrically conductive material;

each of said stylus elements being contoured to have a narrow forward operating tip, a lower edge defining a reference plane, an upper edge tapering from said operating tip away from said reference plane to a first level a first distance from said reference plane and having a stepped rear edge defining a second level a second distance from said reference plane;

said plurality of stylus elements being laminated and having an electrically insulating layer between adjacent stylus elements forming a unitary stylus array;

electrical connection means secured to said first level of alternate ones of said stylus elements in said array and further electrical connection means secured to said second level of the intermediate ones of said stylus elements in said array.

4,390,888

X-Y INFRARED CCD SENSOR AND METHOD FOR MAKING SAME

Lothar Risch, Ottobrunn, and Hermann Mader, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

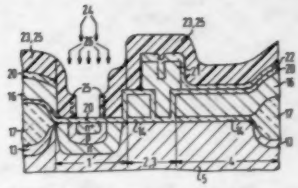
Filed Aug. 28, 1980, Ser. No. 182,472
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943143
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **5 Claims**

1. An infrared radiation-sensitive device in a p-doped silicon substrate comprising:

an infrared sensor consisting of an n^+pn diode having a three-layer structure expanding in the vertical direction in said substrate;

said layers of said diode in said three-layer structure respectively functioning as an emitter, a base and a collector, said emitter layer having a doping density greater than the doping density of said base layer, and said doping density of said base layer being greater than the doping density of said collector layer,

said base layer being the central layer in said three-layer structure and having a thickness such that for a selected doping of said central layer a region of said central layer is depleted of free charge carriers with no voltage applied thereto;



an n-channel charge coupled device in said substrate having an array of clocked transfer electrodes disposed on an insulating layer above said substrate; and

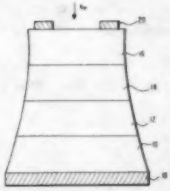
a clocked metal-oxide-semiconductor storage electrode disposed on said insulating layer between said sensor and one of said transfer electrodes for periodically transferring charge generated in said sensor by incident infrared radiation to said charge coupled device.

4,390,889

PHOTODIODE HAVING AN INGAAS LAYER WITH AN ADJACENT INGAASP P-N JUNCTION

Federico Capasso, Westfield; Albert L. Hutchinson, Piscataway, and Ralph A. Logan, Morristown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 9, 1980, Ser. No. 195,333
Int. Cl.³ H01L *29/90, 29/161, 29/14*
U.S. Cl. 357—30 **18 Claims**



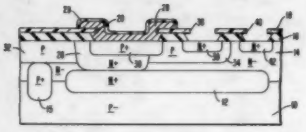
1. A photodiode comprising a semiconductor substrate having a first conductivity type, a first lattice matched semiconductor layer disposed on said substrate and having said first conductivity type;

a lattice matched p-n junction in a second lattice matched semiconductor disposed on said first semiconductor layer characterized in that said second semiconductor has a bandgap larger than the bandgap of said first semiconductor; said p-n junction is formed by a second semiconductor layer having a first conductivity type and a third semiconductor layer having a second conductivity type; said second semiconductor layer having a dopant concentration less than $10^{16}/cm^3$.

4,390,890
SATURATION-LIMITED BIPOLAR TRANSISTOR DEVICE

David L. Bergeron, Winooski, Vt., and Parsotam T. Patel, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1980, Ser. No. 163,035
Int. Cl.³ H01L 27/04
U.S. Cl. 357—44 4 Claims

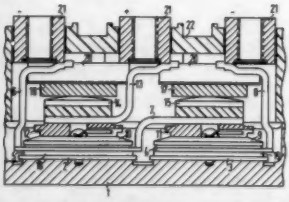


1. A semiconductor structure comprising;
a semiconductor substrate having a first N type region, a first P type region having first and second sections disposed between said first N type region and a surface of said substrate, a second N type region disposed between said first and second P type sections, extending from said surface to said first N type region and having a given maximum dopant concentration, a third N type region disposed between the second section of said first P type region and said first N type region having a maximum dopant concentration lower than that of said second N type region, a fourth N type region formed within the second section of said P type region at said surface and a second P type region having a maximum dopant concentration substantially higher than the maximum dopant concentration in said first P type region and disposed at said surface within said substrate in contact with said second N type region and said second section,
first contact means connected to said second N type region through said first N type region,
second contact means connected to said fourth N type region,
third contact means connected to the first section of said first P type region, and
fourth contact means connected to said second P type region.

4,390,891
SEMICONDUCTOR COMPONENT WITH A PLURALITY OF SEMICONDUCTOR ELEMENTS

Walter Bahlinger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,592
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942409
Int. Cl.³ H01L 23/42
U.S. Cl. 357—79 4 Claims

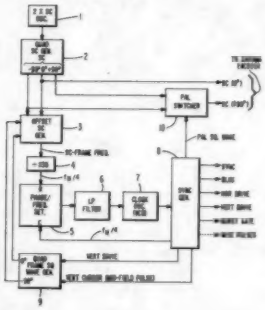


1. Semiconductor component having a plurality of semiconductor elements disposed in a case, including a bottom of the case, and case terminals, comprising conductor bars electrically connecting the semiconductor elements to each other and to the case terminals, the semiconductor elements being in thermal and pressure contact with the bottom through at least one of said conductor bars and being electrically insulated from the bottom, pressure contacts disposed between the semiconductor elements and said conductor bars, said conductor bars being formed of first sections of relatively large width associated with the pressure contacts, and second sections of relatively small width connected to said first sections, said first sections of said conductor bars being circular and having diameters being at least substantially equal to the diameter of the semiconductor elements, and said first sections of said conductor bars having a surface resting against the semiconductor elements, said first sections being lapped flat and uniformly roughened at least on said surface resting against the semiconductor elements.

4,390,892
TV SYNC GENERATOR SYSTEM FOR PAL STANDARDS

Arthur J. Banks, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 20, 1981, Ser. No. 313,163
Claims priority, application United Kingdom, Jan. 26, 1981, 8102285
Int. Cl.³ H04N 9/44
U.S. Cl. 358—17 6 Claims



1. A PAL television synchronization generator system comprising a quadrature subcarrier generator having an input for receiving a reference frequency signal and an output means for providing a pair of quadrature phase related subcarrier signals; an offset subcarrier generator having an input coupled to said quadrature generator output means and an output means for providing a subcarrier signal that is frequency offset with respect to said quadrature subcarrier signals and having phase steps of ninety degrees of the subcarrier signal occurring twice per field; and a phase locked loop having an error signal and coupled to said offset subcarrier generator output means; whereby said error signal in said phase locked loop is easily filtered.

4,390,893
DIGITAL COLOR MODULATOR

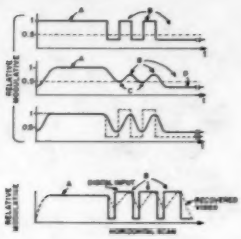
Gilbert E. Russell, Hayward, and Hee Wong, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 15, 1980, Ser. No. 216,469
Int. Cl.³ H04N 9/535; G01G 1/28
U.S. Cl. 358—27 2 Claims

1. A method for precompensating a digital signal represent-

ing a dot-by-dot color video signal for the apparent high luminance of yellow in a NTSC format comprising the steps of:

detecting a yellow dot;



reducing the chrominance level of the yellow dot; and

increasing the luminance level during the period of the yellow dot.

4,390,894

NOISE SUPPRESSION CIRCUIT FOR A VIDEO SIGNAL

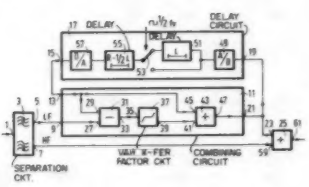
Johannes G. Raven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 288,235

Claims priority, application Netherlands, Aug. 20, 1980, 8004697; Feb. 18, 1981, 8100788

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—36 **4 Claims**



1. A noise suppression circuit for a video signal, comprising a delay circuit having a time delay of substantially one field period and a combining circuit in which an output signal of the delay circuit is combined with an input signal, characterized in that the actual time delay of the delay circuit is switchable between one field period minus half a line period for alternate field scanning periods and one field period plus half a line period for the intervening field scanning period.

4,390,895

COLOR IMAGE PICK-UP APPARATUS

Itsuzo Sato, Chigasaki; Kazushige Ooi, Sagamihara; Kikuo Saito, Yokohama; Yasuo Takemura, Tokyo, and Toshihiro Shinohara, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 11, 1981, Ser. No. 301,440

Claims priority, application Japan, Oct. 7, 1980, 55-139369

Int. Cl.³ H04N *9/04*

U.S. Cl. 358—44 **9 Claims**

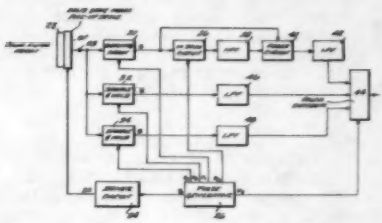
1. A color image pick-up apparatus comprising:

a substantially planar array of solid state light-sensitive elements;

a filter mosaic made up of individual filter elements which are superposed in one-to-one registry on said light-sensitive elements, said mosaic being comprised of a first type of element sensitive to a spectral region corresponding to luminance and associated with the color green, a second type of element sensitive to one spectral region corresponding to chrominance and associated with the color red, and third type of element sensitive to a different spectral region corresponding to chrominance and associated with the color blue, the three types of elements occurring in repeating patterns which are such that over at least a major portion of said array luminance-type elements occur at every other element position along both of two orthogonal directions of said array;

separating means for separating said signals associated with red, green, and blue from the output signal of said solid state image pick-up device;

extracting means for extracting a high frequency component



from said signal corresponding to luminance and associated with green;

means for adding said high frequency component signal corresponding to luminance and associated with green to the signal corresponding to luminance produced from the adjacent horizontal element of said solid state light-sensitive element; and

color encoder means, connected to said separating means and adding means, for producing color video signals from the signals corresponding to said luminance and chrominance.

4,390,896

POWER SUPPLY CIRCUIT

Hubert J. Ploumen, Borne, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

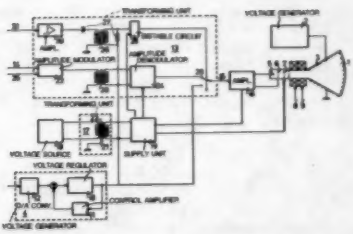
PCT No. PCT/NL80/00021, § 371 Date Feb. 26, 1981, § 102(e) Date Feb. 26, 1981, PCT Pub. No. WO81/00182, PCT Pub. Date Jan. 22, 1981

PCT Filed Jun. 10, 1980, Ser. No. 243,963

Claims priority, application Netherlands, Jun. 27, 1979, 79/04989

Int. Cl.³ H04N *9/27*

U.S. Cl. 358—73 **2 Claims**



1. A power supply circuit for applying a rapidly varying high voltage to a penetron-type cathode ray tube for a color display system, comprising a first voltage generator for supplying a constant high voltage to the anode, a second voltage generator for supplying to the cathode a voltage having a varying magnitude representative of different colors, a first transforming unit for converting video signals referenced to a first reference voltage into video signals reference to the volt-

age having a varying magnitude which serves as a second reference voltage, a second transforming unit for converting a supply voltage referenced to the first reference voltage into a supply voltage reference to the second reference voltage, and a supply unit for deriving from the supply voltage referenced to the second reference voltage supply voltages for the first transforming unit and the cathode ray tube;

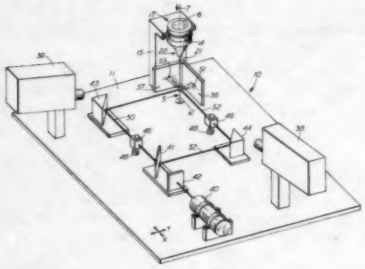
characterized in that the first transforming unit comprises an amplitude modulator, a first inductive coupling, and an amplitude demodulator for respectively modulating at a carrier frequency the video signals referenced to the first reference voltage, converting the modulated video signals into signals referenced to the second reference voltage, and demodulating the converted video signals, said inductive coupling comprising primary and secondary windings and a shield between said windings having the potential of the first reference voltage.

4,390,897

TECHNIQUE FOR AUTOMATICALLY CENTERING A LIGHTGUIDE FIBER IN A COATING

David H. Smithgall, Sr., East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 17, 1981, Ser. No. 255,077
Int. Cl.³ H04M *7/00*
U.S. Cl. 358—101 **9 Claims**



1. A method of automatically centering a lightguide fiber in a light transmissive coating material having an index of refraction lower than that of the fiber, comprising the steps of:

(a) directing a light beam at the coated fiber to cause a forward scattered light intensity pattern to impinge on a screen, the pattern having a high intensity central peak and a first and second outboard interference fringes;

(b) monitoring the forward scattered light pattern to determine the period of each of the first and second outboard interference fringes; and

(c) comparing the period of the fringes to determine the eccentricity of the fiber within the coating in a plane normal to the light beam.

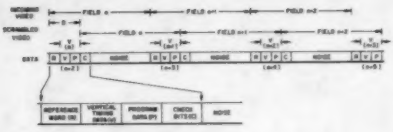
4,390,898

SCRAMBLING AND UNSCRAMBLING VIDEO SIGNALS IN A PAY TV SYSTEM

John A. Bond; Yuan-Lu Li, both of Ottawa, and Leslie J. Crane, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 23, 1981, Ser. No. 246,878
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—119 **16 Claims**

1. A method of scrambling a video signal, comprising video signal lines and vertical intervals, to produce a scrambled video signal, said method comprising replacing each vertical interval by dummy video signal lines and separately providing information relating to the timing of the replaced vertical intervals of the scrambled video signal, wherein different numbers of dummy video signal lines are used to replace different



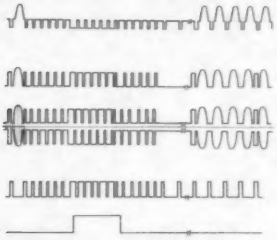
vertical intervals, whereby the field length of the scrambled video signal is varied.

4,390,899

TELEVISION SIGNAL PROCESSING SYSTEM

Hiroshi Osaka, and Akira Honma, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,782
Claims priority, application Japan, Dec. 29, 1979, 54-173104
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—120 **3 Claims**



1. A television processing system in a wireless pay-television system wherein a television signal is encoded by an encoder, the coded signal is transmitted to subscribers' ends, and the coded signal received at each of the subscribers' ends is decoded into an ordinary television signal by a decoder,

which system is characterized in that said encoder processes and encodes the television signal by inverting a synchronizing signal component thereof with reference to a pedestal level and expanding said component to an extent not exceeding a peak value of a video signal component and by reducing the number of horizontal synchronizing signal components so that each of the horizontal synchronizing signal components may correspond to plural lines; said decoder including:

a horizontal synchronizing signal extracting circuit adapted to be driven by the coded television signal for generating a signal having the same period as a horizontal synchronizing signal;

a vertical synchronizing signal extracting circuit adapted to be driven by the coded television signal for generating a signal having the same period as a vertical synchronizing signal;

a PLL circuit for obtaining a signal having the same frequency and the same phase as the horizontal synchronizing signal component from an output from said horizontal synchronizing signal extracting circuit;

a switching signal generating circuit adapted to be driven by an output from said PLL circuit and the output from said vertical synchronizing signal extracting circuit for producing a switching signal;

a synchronous reproducing circuit adapted to be driven by the output from said vertical synchronizing signal extracting circuit and the output from said PLL circuit; and

a television signal switching circuit adapted to be driven by the switching signal for selectively outputting the coded

television signal or an output from said synchronous reproducing circuit.

4,390,900

BIDIRECTIONAL INFORMATION TRANSMISSION VIA A LONG DISTANCE VIDEO INTERFACE (LDVI) CABLE

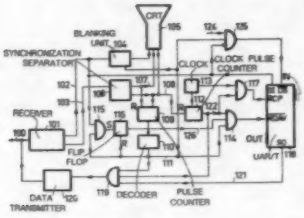
Hendrik Van Kampen; Joseph G. Rouland, and Hendrik J. Baakman, all of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,440

Claims priority, application Netherlands, Apr. 25, 1980, 8002412

Int. Cl.³ H04N 7/00

U.S. Cl. 358—147 4 Claims



1. A data processing system, comprising a main station (HS) and a peripheral station (PS) which are connected by a video line, the main station comprising a control unit (1) with at least one processing unit (3), a memory (2), and a video control unit (VCU) (4), the peripheral station comprising a video interface (6) to which I/O apparatus (7, 8, 9) is locally connected, an input of the video control unit being connected to the memory in order to form a composite video signal from the display information received for a video picture which is line-wise scanned; the VCU comprising first means for inserting data information from the memory into the composite video signal during at least one line duration during which the video picture has to be blanked, a video line (LDVI) (5), which is connected on the one side to an output of the said video control unit and on the other side to an input of the video interface, the peripheral station also comprising a display apparatus for a video picture which is line-wise scanned, said display apparatus being connected to an output of said video interface, the video interface comprising second means for extracting said inserted data information from the composite video signal in order to make this data information available to a local data processing device which is also suitable for receiving further data information from the I/O apparatus present, characterized in that said second means are also suitable for applying said further data information to said video line and for inserting this further data information into the composite video signal during at least one line duration during a period which the picture has to be blanked, the video control unit comprising third means for extracting said further data information from the composite video signal in order to transfer said further data information to said memory.

4,390,901

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF A TELEVISION SIGNAL RECEIVER

Edmond Keiser, Loferweg 6, Gröbenzell, Fed. Rep. of Germany (8031)

Filed Oct. 16, 1980, Ser. No. 197,672

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950432

Int. Cl.³ H04N 9/491

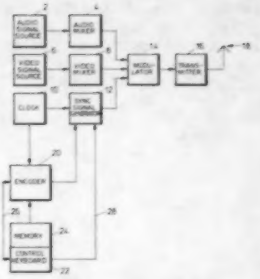
U.S. Cl. 358—147 6 Claims

1. A method for controlling operation of a television signal receiver comprising the steps of:

(a) providing a code signal representing information with respect to the type of program at the transmitter side,

(b) inserting the code signal into the vertical blanking gap of the television signal to be transmitted therewith,

(c) detecting and analyzing the code signal at the receiver side, and



(d) actuating the receiver unit in response to detection of a predetermined code signal in said detecting step, characterized in that said actuating step includes controlling of a video recorder for recording a selected type of program.

4,390,902

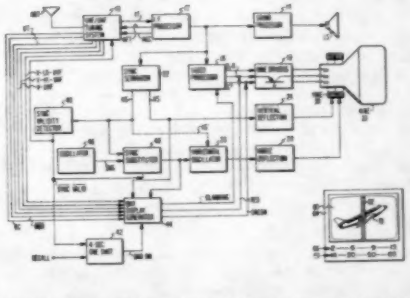
TUNING DISPLAY FOR A TELEVISION RECEIVER

Danny Chin, Plainsboro; John G. N. Henderson, Princeton, and Robert J. Maturo, Bricktown, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,617

Int. Cl.³ H04N 5/50

U.S. Cl. 358—192.1 10 Claims



1. In a television (TV) receiver which receives TV signals in a plurality of frequency bands and which includes tuning means for developing a tuning signal to select one of said TV signals, processing means for developing video signals responsive to said selected TV signal, deflection means for developing a periodic deflection signal responsive to said selected TV signal, and display means for displaying a picture responsive to said video signals and to said deflection signal,

apparatus comprising:

blanking means responsive to said tuning signal for eliminating the display of a portion of said picture, which means includes

delay means responsive to said tuning signal for developing a trigger signal delayed in time from a predetermined condition of said deflection signal, which time delay is related to said tuning signal and is shorter than the period of said deflection signal,

pulse generation means responsive to said trigger signal for

generating a pulse signal having a time duration substantially shorter than the period of said deflection signal, and

first driver means responsive to said pulse signal and coupled to said processing means for inhibiting said video signals from being applied to said display means during said pulse signal duration, whereby the display of the portion of said picture during said pulse signal duration is eliminated; and

tuning indicator means for causing a tuning indication signal to be displayed on said display means within the blanked portion of said picture during said pulse signal duration, which means includes

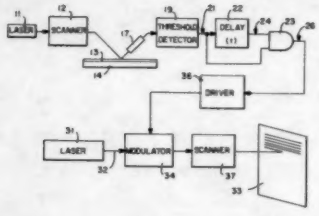
second driver means responsive to said pulse signal for applying said tuning indication signal to said display means unaffected by said video signals during said pulse signal duration.

4,390,903

IMAGING SYSTEM AND METHOD WITH MID-TONE ENHANCEMENT

Keith H. Pomeroy, San Juan Capistrano, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 23, 1980, Ser. No. 143,814
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—282 **10 Claims**



1. In a method for forming an image of an object on an output medium, the steps of: scanning the object to provide a video signal which varies in level in accordance with the object, processing the video signal to provide a generally rectangular signal comprising a series of pulses of predetermined height and a width which varies in accordance with the level of the video signal, decreasing the width of each one of the pulses by a predetermined fixed amount, scanning a writing beam across the output medium and modulating the beam in accordance with the pulses of decreased width to form an image of the object on the output medium.

4,390,904

AUTOMATIC CIRCUIT AND METHOD FOR EDITING COMMERCIAL MESSAGES FROM TELEVISION SIGNALS

Howard R. Johnston, Burnaby, and Michael E. R. V. Koombes, Vancouver, both of Canada, assignors to Shelton Video Editors, Inc., Bellingham, Wash.

Filed Sep. 20, 1979, Ser. No. 77,733
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—335 **15 Claims**

11. In combination, a video tape recorder for recording a television signal and having a pause control for temporarily interrupting said recording in response to the receipt of a pause control signal, and a commercial message editing circuit for producing said pause control signal, wherein the improvement in said commercial message editing circuit comprises:

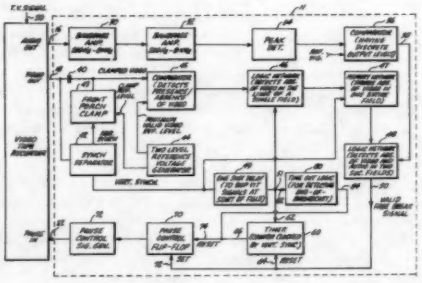
detection circuit means for detecting each of a series of breaks in a telecast that are indicative of one or more commercial interruptions in non-commercial program content and in which each of such breaks is associated with a predetermined amplitude condition of the video and audio components of the television signal that exists for a predetermined minimum time greater than one video field duration, said detection circuit means comprising means for detecting said predetermined amplitude condition of said video component of the television signal existing for said predetermined minimum time, and means for detecting a predetermined audio level of said audio component of the television signal existing for said predetermined minimum time;

electrical timing means having a retriggerable timing mode providing a predetermined time-out interval, said timing means being initially triggered and thereafter retriggered by said detection circuit means in response to the detection of successive breaks in a telecast; and

means responsive to said electrical timing means for producing said pause control signal in response to and for so long as said electrical timing means is in said retriggerable timing mode, and for terminating said pause control signal when said electrical timing means times out at the end of said predetermined time-out interval.

13 A method of editing commercial messages from a video tape recording of a telecast in which such messages interrupt the non-commercial program content of such telecast, the steps comprising:

recording the telecast on a video tape recorder;



electrically detecting each of a series of breaks that occur in said telecast and that are characterized by a predetermined amplitude condition of the video and audio components of the television signal existing for a predetermined minimum time greater than one video field duration, and in which a first of such series of breaks marks the beginning of a first commercial message and succeeding breaks in such series occur at time intervals that do not normally exceed a predetermined time period, and in which a last of such series of breaks indicates the resumption of non-commercial program content of said telecast;

automatically initiating a timing interval of predetermined duration in response to the detection of a first of said series of breaks, and automatically restarting said timing interval each time a succeeding break in said series is detected, selecting said timimg interval of predetermined duration to be equal to or just greater than said predetermined time period;

generating said editing control signal in response to the step of detecting a first of said series of breaks, and continuing to generate said control signal until said timing interval times out without being restarted; and

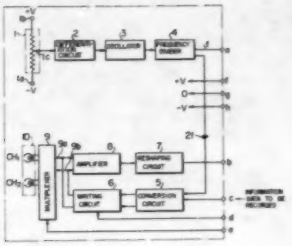
applying said editing control signal to the video tape recorder for temporarily interrupting the recording step for the duration of said control signal.

4,390,905

MAGNETIC CARD RECORDING APPARATUS

Naoki Tokitsu, Chiryu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 22, 1981, Ser. No. 276,251
Claims priority, application Japan, Jul. 24, 1980, 55-101671
Int. Cl.³ G11B 5/09, 25/04
U.S. Cl. 360—2 9 Claims



1. An apparatus for magnetically recording information on a magnetic card comprising:

guide means disposed to guide a moving magnetic card;

magnetic head means positioned to contact with said magnetic card moving through said guide means;

electric signal generator means having a movable member moved in response to the movement of said magnetic card for producing an output electric signal having a characteristic corresponding to said movement;

voltage signal generator means receiving said output electric signal for generating an output voltage signal of a magnitude proportional to a speed of the movement of said magnetic card;

oscillator means oscillating at a frequency proportional to the magnitude of said output voltage signal of said voltage signal generator means;

converting means receiving an input information signal to be recorded for converting the same in response to an output signal of said oscillator means; and

writing control means controlling the recording of an output signal of said converting means on said magnetic card;

whereby the recording of information with a predetermined high recording density is enabled irrespective of the moving speed of said magnetic card,

wherein said electric signal generator means includes a varible resistor having a movable member moved by said moving magnetic card, and

wherein said voltage signal generating means includes differentiation circuit means for producing said output voltage signal as a differentiation of said output electric signal from said electric signal generator means.

4,390,906

MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM FOR TELEVISION AND AUDIO SIGNAL

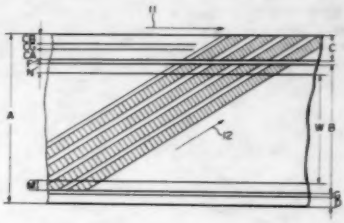
Mitsunobu Furumoto, Yao; Osahiko Yano, Ibaraki; Hiroshi Taniguchi, Hirakata; Kanji Kubo, Katano, and Masamitsu Ohtsu, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Apr. 17, 1981, Ser. No. 255,348
Claims priority, application Japan, Apr. 23, 1980, 55-52852
Int. Cl.³ H04N 5/78
U.S. Cl. 360—19.1 16 Claims

1. A magnetic television signal recording system characterized by having:

a first recording mode in which a video signal is recorded by rotating magnetic heads in a series of oblique tracks on a magnetic tape, said oblique tracks being inclined at an angle with respect to the center line of said magnetic tape and being discontinuous, and wherein an audio signal is time-compressed and recorded with said rotating heads at predetermined portions of said oblique tracks adjacent to the ends thereof, and

a second recording mode in which the audio signal is recorded by means of a stationary head in a track parallel to the center line of said magnetic tape;



the tracks in which the audio signal is recorded in said first recording mode and the track in which the audio signal is recorded in said second recording mode being wholly or partially coincident with each other; and

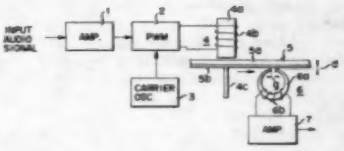
means for selectively causing said television signal recording system to operate in said first recording mode or said second recording mode.

4,390,907

MAGNETIC RECORDING SYSTEM

Tatsuo Fujiwara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 12, 1980, Ser. No. 177,721
Claims priority, application Japan, Sep. 17, 1979, 54-119092
Int. Cl.³ G11B 5/00, 5/02, 5/09
U.S. Cl. 360—32 11 Claims



1. A magnetic recording and reproducing system comprising a means for pulse width modulating a carrier wave with a frequency higher than the frequency of an input signal by said input signal, a means for vertical magnetization recording said pulse width modulation of the carrier wave on a magnetic recording medium, and a reproducing means for reproducing the input signal recorded on the magnetic recording medium, means having a high sensitivity characteristic with respect to the input signal component of the modulation recorded in said recording medium and a low sensitivity characteristic with respect to the carrier wave component of the modulation.

4,390,908

PHASE SERVO CIRCUIT

Tadahiko Nakamura, Ayase; Kenji Nakano, Yokohama, and Shigeru Tajima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

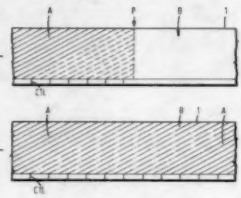
Filed Nov. 12, 1980, Ser. No. 206,055
Claims priority, application Japan, Nov. 12, 1979, 54-146290
Int. Cl.³ G11B 27/02; H04N 5/78
U.S. Cl. 360—70 15 Claims

1. A phase servo circuit for controlling at least one rotatable

magnetic head which is used for recording and/or reproducing a video signal, comprising:

pulse generator means for producing a pulse signal synchronous with the rotating phase of said at least one rotatable magnetic head;

control signal generating means for generating a control signal having a pulse width modulated in response to a first phase difference between said pulse signal and a first synchronizing signal of a video signal to be recorded for controlling said rotating phase of said at least one rotatable magnetic head;



phase difference detecting means for detecting a second phase difference between said first synchronizing signal and a second synchronizing signal of a reproduced video signal; and

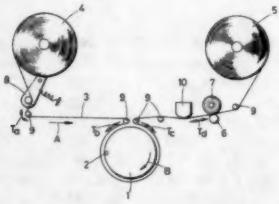
modulating means for supplying a reference signal to said control signal generating means in response to said phase difference detecting means so that said pulse width of the control signal is further modulated in response to the second phase difference detected by said phase difference detecting means.

4,390,909

VIDEO SIGNAL REPRODUCING APPARATUS WITH TAPE TENSION CONTROL ARRANGEMENT

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 220,100
Claims priority, application Japan, Dec. 29, 1979, 54-171746
Int. Cl.³ G11B *15/43*
U.S. Cl. 360—71 **19 Claims**



1. Apparatus for reproducing video signals recorded on a magnetic tape, comprising:

transducer means for reproducing the video signals recorded on said magnetic tape;

capstan assembly means for adjusting the amount of tension on said magnetic tape;

tape tension detecting means for detecting the amount of tension on said magnetic tape; and

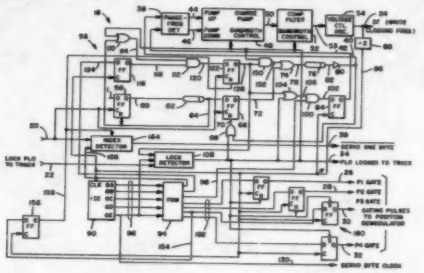
tape tension control means for controlling said capstan assembly means to maintain the tension on said magnetic tape within a predetermined range in response to the amount of tension detected by said tape tension detecting means and the speed and direction of movement of said magnetic tape.

4,390,910

PHASE-LOCK OSCILLATOR

Rosser S. Wilson, Danville, Calif., assignor to Ball Corporation, Muncie, Ind.

Filed Jan. 30, 1981, Ser. No. 229,869
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **25 Claims**



1. A phase-lock oscillator for use in conjunction with a movable servo surface having a servo encoding scheme which includes timing information and position-indicating-information, comprising:

(a) means, responsive to an error signal, for generating a write clocking frequency signal;

(b) means, responsive to first and second input signals, for generating the error signal;

(c) means for acquiring initial synchronization including

(i) means, responsive to the timing information, for generating the first input signal, and

(ii) means, responsive to the write clocking frequency signal, for generating the second input signal;

(d) means for tracking the acquired synchronization including

(i) means, responsive to the timing information occurring within a narrow interval straddling the expected time of arrival of the timing information, and the write clocking frequency signal, for generating the first input signal in phase coherence with the timing information, and

(ii) means, responsive to the write clocking frequency signal and timing information, for generating the second input signal in phase coherence with the write clocking frequency signal, and in frequency coherence with the timing information; and

(e) means for generating gating pulses in response to the write clocking frequency signal to demodulate the position-indicating-information.

4,390,911

SIGNAL SEPARATION IN MAGNETIC RECORDING USING BURIED SERVO

Klaas B. Klaassen, 's Gravenzande, Netherlands, assignor to International Business Machines Corporation, Armonk, N.Y.

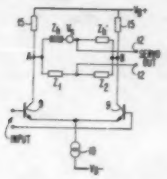
Filed Apr. 30, 1981, Ser. No. 259,269
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **7 Claims**

1. In a track following servo system for a magnetic record member in which servo information is recorded underneath data information on the magnetic record member, and the same magnetic transducer is used to simultaneously read the servo information and write the data information, the transducer having a predetermined impedance characteristic, the improvement comprising:

impedance means having an impedance characteristic

matching said predetermined impedance characteristic of said transducer,

circuit means connecting said impedance means to the output of said magnetic transducer, and



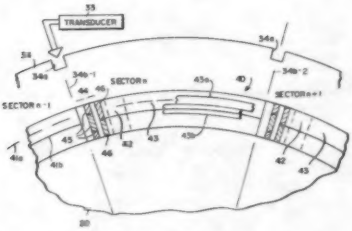
servo output means connected to said circuit means to produce a servo output signal in which the voltage generated in said transducer during the writing of data information is effectively cancelled due to the presence of said impedance means.

4,390,912

TRANSDUCER POSITIONING SYSTEM AND DATA DISK THEREFOR

Friedrich R. Hertrich, and Slobodan R. Perera, both of Boulder, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 12, 1980, Ser. No. 206,008
Int. Cl.³ G11B *21/08, 21/10*
U.S. Cl. 360—78 **9 Claims**



1. A magnetic disk for a disk drive unit that is used in a secondary storage facility for a data processing system that includes magnetic disk rotating means, movable transducer means and servo controller means, said magnetic disk being adapted for mounting on the rotating means adjacent to the movable transducer means whereby the movable transducer means generates read signals in response to recordings on the disk surface, said magnetic disk comprising:

A. a plurality of data sectors,

(1) each data sector spanning an angular portion of the disk spaced apart from other data sectors, and

(2) disposed within said data sectors, at least two radially interleaved sets of data tracks centered on corresponding circular track centerlines,

B. a plurality of servo sectors alternating with said data sectors, each servo sector including at least two sets of servo information blocks which are circumferentially spaced from each other and each of which contains first and second assymmetrical, time-displaced complementary zero information signals recorded alternately in radially adjacent servo information blocks, the phase boundaries of the servo information signals in radially adjacent blocks defining the respective sets of said circular track centerlines, and

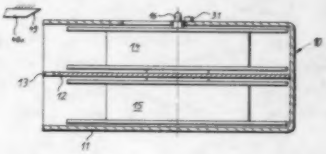
C. sector indicia means for indicating the angular location of said servo sectors whereby the servo controller means is responsive to the read signals produced by the recordings in said servo sectors for locating said movable transducer means with respect to said data tracks.

4,390,913

TAPE CASSETTE AND CASSETTE RECEIVER COMBINATION FOR TRANSDUCING APPARATUS

Wolfgang Fell, Seeheim, and Werner Sanders, Darmstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,839
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951109
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—85 **11 Claims**



1. A tape transducing system comprising the combination of

a tape cassette (**10**) including a cassette housing (**11**) open at one end,

a tape reel carrier (**12**) longitudinally slidably mounted in the cassette housing for sliding movement in a plane transverse to the winding axis of the tape reels, for carrying tape reels (**14, 15**) thereon in superposed relation,

and operating engagement means (**16**) coupled to the tape reel carrier (**12**);

with

a tape cassette receiver including

a support structure defining a receiver chamber (**1**) open at one side to receive said cassette housing (**11**) with the tape reel carrier (**12**) and tape reels (**14, 15**) thereon upon sliding movement of the cassette housing (**11**) into said chamber,

a movable lever (**32**) secured to the support structure positioned to be engageable by said cassette housing (**11**);

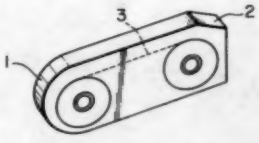
and coupling means (**41**) for coupling the lever (**32**) to the operating and engagement means (**16**) of the tape reel carrier (**12**) and effecting longitudinal removing sliding movement of the tape reel carrier (**12**) and said reels (**14, 15**) thereon out of the cassette housing (**11**) upon insertion movement of the cassette housing into said chamber.

4,390,914

TAPE CASSETTE AND SOUND RECORDING AND REPRODUCING APPARATUS FOR USE THEREFOR

Shinichi Nagai, 17-2, Kitanakafuri 3-chome, Hirakata-shi, Osaka-fu 573, Japan

Filed Jan. 29, 1981, Ser. No. 229,507
Int. Cl.³ G11B *23/04;* G03B *1/04;* G11B *23/46, 15/60*
U.S. Cl. 360—96.5 **5 Claims**



1. A tape cassette comprising a housing having a semi-circular shape on either of the left or right sides thereof with angular

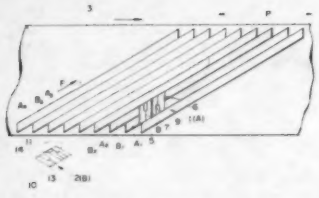
corners on the other of said left or right sides with either the upper or lower corner of said angular corners being obliquely cropped such that said tape cassette is oriented, both from the left to the right and in such a manner such that said cassette cannot be inserted in an upside-down manner.

4,390,915

HELICAL SCAN TYPE VIDEO TAPE RECORDER

Atsuo Matsuyama, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,863
Claims priority, application Japan, Dec. 11, 1979, 54-160505
Int. Cl.³ G11B 5/52, 5/28, 27/02
U.S. Cl. 360—104 15 Claims



1. A helical scan type video tape recording apparatus having an editing function, comprising:

a rotary body;

a rotary video head secured to said rotary body for recording video signals on a video tape in a plurality of skewed video tracks;

recording control means for supplying recording current to said video head in response to a recording command signal;

a rotary erase head secured to said rotary body for erasing video signals recorded in selected video tracks, said rotary erase head being positioned to scan said video tracks ahead of said video head by at least one video tracks interval; and

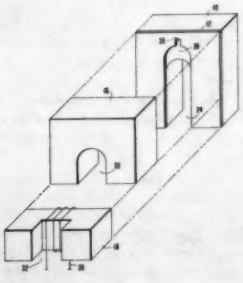
erasing control means for supplying erasing current to said rotary erase head in response to said recording command signal.

4,390,916

SINGLE TRACK MAGNETIC HEAD ASSEMBLY

William W. Chow, and Larry P. Dunn, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,766
Int. Cl.³ G11B 5/42, 5/20, 5/221
U.S. Cl. 360—127 6 Claims



1. A magnetic head assembly comprising:

a nonmagnetic substrate having a slot extending upwardly from one edge;

a thin film layer of magnetic material deposited on a flat surface of said substrate generally normal to said edge, said thin film layer having a slot contiguous with the first-mentioned slot and of greater height as measured from said edge, terminating in a transducing gap which is of substantially narrower width than said slots and extends to a transducing face defining the upper end of the assembly and has a height corresponding to a preselected desired throat height;

a nonmagnetic closure joined to said thin film layer and extending downward from said transducing face part way toward said edge, said closure having a slot substantially aligned with and substantially the same width as the upper portion of said first-mentioned slot;

a magnetic bridge structure joined to said thin film layer and extending from the bottom of said closure to said edge, said bridge structure having a U-shaped recess aligned with said slots and extending laterally inward part way toward said thin film layer;

said thin film layer separating said substrate from said closure and bridge structure and making planar contact with said bridge structure and being bisected by the slot and gap therein to form two substantially symmetrical pole pieces; and

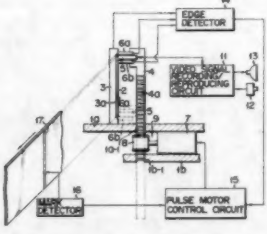
electric coil means disposed within said recess and wound about said bridge structure.

4,390,917

DEVICE FOR DETECTING EDGE OF MAGNETIC TAPE FOR RECORDING SIGNALS

Seizo Watanabe, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,657
Claims priority, application Japan, Jul. 24, 1979, 54/93901; Jul. 24, 1979, 54/101952[U]; Jul. 24, 1979, 54/101953[U]
Int. Cl.³ G11B 21/08, 5/12, 15/48, 5/02
U.S. Cl. 360—128 10 Claims



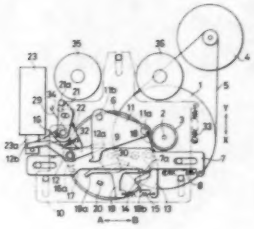
1. A device for detecting the edge of a magnetic tape for recording signals, comprising: first means provided integral with a magnetic head and arranged such that it extends beyond at least one edge of the magnetic tape when the magnetic head is brought to a position corresponding to an end track adjacent to said one edge of the tape, second means stationarily provided on the side of the tape opposite said first means such that it can be faced by said first means when the latter extends beyond said at least one edge, and tape edge detection signal generating means coupled to said first and second means such as to produce a tape edge detection signal when said first means is brought to a position facing said second means.

4,390,918

OPERATING MODE SWITCHING MECHANISM FOR A TAPE RECORDER

Shigeru Matsumoto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 20, 1981, Ser. No. 236,632
Claims priority, application Japan, Feb. 22, 1980, 55-20405
Int. Cl.³ G11B 15/10
U.S. Cl. 360—137 13 Claims



1. An operating mode switching mechanism for a tape recorder having a movable carrier member carrying thereon an electromagnetic transuducer and movable between first and second positions, a tape driving mechanism arranged to drive a magnetic tape at a constant speed when said carrier member assumes said second position, a plurality of manually operating keys for effecting various operations, and a motor, comprising;

(a) a single solenoid aranged to be energized by pulses applied thereto in response to the operation of said operating keys;

(b) a rotary wheel;

(c) means for locking said rotary wheel at a predetermined angular position and for unlocking the same in response to the energization of said solenoid;

(d) means for rotating said rotary wheel after unlocked so that said rotary wheel provides a 360 degree revolution from said predetermined angluar position;

(e) means responsive to the rotation of said rotary wheel for causing said carrier member to move from said first position to said second position against a biasing force only when said solenoid is being energized until said rotary wheel is rotated by a first predetermined angle;

(f) means responsive to the rotation of said rotary wheel for locking said carrier member in an intermediate position between said first and second positions only when said solenoid is being energized during the time said carrier member assumes said second position until said rotary wheel is rotated by a second predetermined angle which is smaller than said first predetermined angle;

(g) means responsive to the rotation of said rotary wheel for causing said carrier member to move from said second position to said first position when said solenoid is being energized until said rotary wheel is rotated by a third predetermined angle which is smaller than said second predetermined angle;

(h) means for detecting the rotational angle of said rotary wheel; and

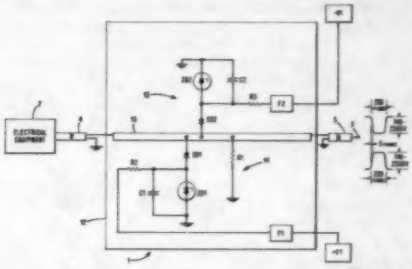
(i) means responsive to the detected angle of said rotary wheel for deenergizing said solenoid when said rotary wheel is rotated by one of said first to third predetermined angles, which has been selected in accordance with said selected operating key.

4,390,919

ELECTRONIC SURGE ARRESTOR

Leon C. Lesinski, Walpole, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,537
Int. Cl.³ H02H 9/04
U.S. Cl. 361—56 14 Claims



1. A fast-response electronic surge arrestor for protecting electrical equipment from large amplitude, fast rise-time transients of first and second polarities, said surge arrestor comprising:

an input;

an elongated conductor coupled to the input and adapted to be coupled to electrical equipment to be protected from transients, said conductor being in the form of a flat microwave strip transmission line disposed on a ground plane substrate and operative to receive transients of first and second polarities presented to the input and also signals in the UHF band for bi-directional transmission between the electrical equipment and the input;

a source of reference potential;

first and second transient suppression circuit means arranged in parallel and coupled between the conductor and the source of reference potential for dissipating transients of the first and second polarities, respectively;

said first transient suppression circuit means comprising:

a first fast-response Zener diode having an internal capacitance of a predetermined value and further having an anode coupled to the source of reference potential and a cathode;

a first switching diode coupled to the conductor and in series with the first Zener diode and having an internal capacitance of a value less than the value of the internal capacitance of the first Zener diode for reducing the effective capacitance between the conductor and the source of reference potential, said first switching diode having an anode coupled to the conductor and a cathode coupled to the cathode of the first Zener diode;

said first Zener diode being operative in response to a large amplitude, fast rise-time transient of the first polarity present on the conductor to dissipate said transient and said first switching diode cooperating with the first diode to minimize dissipation of signals in the UHF band on the conductor; and

a source of positive dc reverse bias voltage coupled to the juncture of the first Zener diode and the first switching diode and operative to establish a positive dc reverse bias voltage at said juncture having a value for further minimizing dissipation of signals in the UHF band on the conductor due to rectification action of the diodes; and

said second transient suppression circuit means comprising:

a second fast-response Zener diode having an internal capacitance of a predetermined value and further having a cathode coupled to the source of reference potential and an anode;

a second switching diode coupled to the conductor and in

series with the second Zener diode and having an internal capacitance of a value less than the value of the internal capacitance of the second Zener diode for reducing the effective capacitance between the conductor and the source of reference potential, said second switching diode having a cathode coupled to the conductor and an anode coupled to the anode of the second Zener diode;

said second Zener diode being operative in response to a large amplitude, fast rise-time transient of the second polarity present on the conductor to dissipate said transient and said second switching diode cooperating with the second Zener diode to minimize dissipation of signals in the UHF band on the conductor; and

a source of negative dc reverse bias voltage coupled to the juncture of the second Zener diode and the second switching diode and operative to establish a negative dc reverse bias voltage at said juncture having a value for further minimizing dissipation of signals in the UHF band on the conductor due to rectification action of the diodes.

4,390,920

SWITCHING DEVICE FOR THE SHORT-CIRCUIT AND OVERLOAD PROTECTION OF A POWER SWITCHING CIRCUIT

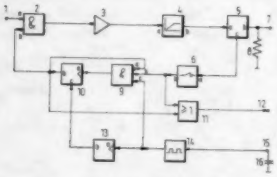
Waldemar Lau, Hockenheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,610

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048249

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—75 **6 Claims**



1. Switching device for the short-circuit and overload protection of a power switching circuit, comprising an input, an output, a first AND gate, a power amplifier, a current limiter circuit and a current sensor connected in series between said input and output, said first AND gate having an inverting input, a threshold value switch connected to said current sensor for producing a current sensor-shaped signal to be fed to said inverting input of said first AND gate, a digital switch-in retarder for delaying the arrival of the current sensor-shaped signal at said inverting input of said first AND gate by producing a given switch-in time lag for blocking said first AND gate until a given switch-off time lag has run out in case of short-circuits and overloads, said digital switch-in retarder including a second AND gate having a first input, a second input, a third inverting input and an output, and a first counter being afterconnected to said second AND gate and having a pulse timing input, a resetting input and an output, said first input of said second AND gate being connected to said threshold value switch, an oscillator connected to said second input of said second AND gate, said third inverting input of said second AND gate being connected to said output of said first counter, said output of said second AND gate being connected to said pulse timing input of said first counter, said output of said first counter being connected to said inverting input of said first AND gate, and a second counter for producing said given switch-off time lag, said second counter having an input connected to said oscillator and an output connected to said resetting input of said first counter.

4,390,921

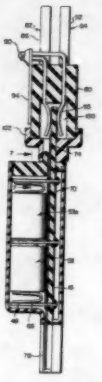
LINE PROTECTOR AND RELATED TERMINATION ARRANGEMENT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 13, 1981, Ser. No. 310,473

Int. Cl.³ H02H *3/20;* **H05K** *5/02*

U.S. Cl. 361—119 **11 Claims**



1. A line protector for a communications circuit comprising a housing having opposite ends, a printed circuit board in said housing and having a part thereof projecting from one of said housing ends, first and second line terminals printed on said board and being electrically insulated from each other, a ground terminal printed on said board and being electrically insulated from each of said line terminals, said printed terminals extending from within the housing to said projected part of the board so as to lie outwardly of said housing and adjacent to one another, a first contact in said housing adjacent to said one end and being electrically connected to said first line terminal, a second contact in said housing adjacent to the other end of said housing and being electrically connected to said second terminal, and a third contact in said housing intermediate the first and second contacts and being electrically connected to said ground terminal; and surge voltage arrester means between said first and second contacts and having a first electrode electrically connected to said first contact, a second electrode electrically connected to said second contact, a ground electrode structure electrically connected to said third contact, each of said contacts being secured to the printed circuit board and projecting therefrom, and an insulator movable relative to said board to overlie the portions of said first and second terminals that are on said projected part while leaving exposed the ground terminal portion on said projected part.

4,390,922

VIBRATION SENSOR AND ELECTRICAL POWER SHUT OFF DEVICE

Raymond A. Pelliccia, 221 Garrett Ave., Chula Vista, Calif. 92010

Filed Feb. 4, 1982, Ser. No. 345,920

Int. Cl.³ H01H *35/14*

U.S. Cl. 361—170 **2 Claims**

1. A vibration detection and electrical power shut off device for interrupting electrical power in a power line when vibrations sensed by the device exceeded a predetermined intensity, comprising:

a pendulum switch member suspended for universal movement and including a rod and a weight at the bottom of said rod, said rod including electrical contact means, and

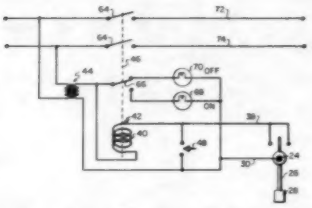
said pendulum switch member being electrically connected to solenoid means;

a contact ring of electrically conductive material surrounding said electrical contact means on said rod in close proximity thereto;

solenoid means connected to said contact ring and to switching means in an electrical power line, said solenoid means being mounted with its actuator rod extending substantially vertical and downward;

a latch arm pivotally mounted at one end to support means, the other end of said arm being pivotally mounted to said solenoid actuator rod with a lock notch in said arm between its ends;

a switch limb pivotally mounted at its lower end to pivot



means on said support means and extending upward so that its free end can position in said notch in the power on position, the limb being positioned slightly over center relative to the pivot means so that it has a tendency to fall outward;

power switch means mounted on said support means; and

light indicator switch means mounted on said support means;

whereby said pendulum moves with vibration and the contact means on said rod touches the contact ring to energize the solenoid means causing said solenoid actuator rod to lift said latch arm upward and release said switch limb whereby it falls outward by gravitational force, opening the power switch means and switching the light indicator switch means to the on position.

4,390,923

CONTROL OF STATIC NEUTRALIZATION

Donald G. Saurenman, Whittier, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation-in-part of Ser. No. 259,503, May 1, 1981, which is a continuation-in-part of Ser. No. 241,684, Mar. 9, 1981, which is a continuation-in-part of Ser. No. 124,242, Feb. 25, 1980. This application Aug. 6, 1981, Ser. No. 290,423

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ H05F *3/06*

U.S. Cl. 361—222 **42 Claims**

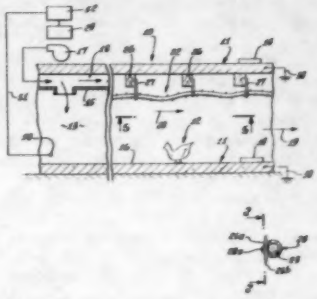
1. The method of reducing static electricity in a work zone, that includes:

(a) providing first electrically conductive cable means with ion dispensing tips spaced therealong, and to which positive voltage is applicable,

(b) providing second electrically conductive cable means with ion dispensing tips spaced therealong, and to which negative voltage is applicable,

(c) said (a) and (b) steps carried out to provide flexible cables having cores to which said voltage is applicable and to have protective sleeves of insulating material on and extending along the cores, the sleeves defining walls, the tips defined by needles having shanks penetrating through the sleeve walls and extending generally sidewardly adjacent core material and make electrical contact therewith so as to receive application of said voltage, the tips openly exposed outwardly of the cables to dispense ions into the atmosphere near the cables,

(d) locating said first and second cable means, at adjusted separations from one another so that static electricity at or



proximate the work is effectively reduced to non-objectionable levels when said positive and negative voltages are applied to the cable means,

(e) and clamping said cable means at said adjusted separations.

4,390,924

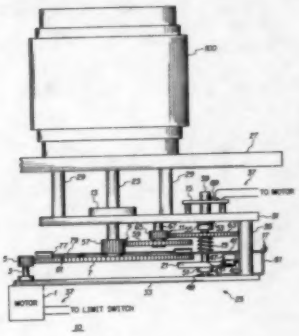
VARIABLE CAPACITOR WITH GEAR TRAIN END STOP

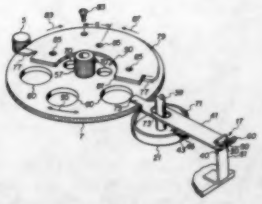
Herman Nebiker, Jr., Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 12, 1981, Ser. No. 262,735

Int. Cl.³ H01G *5/01*

U.S. Cl. 361—279 **13 Claims**





1. In combination, a variable vacuum capacitor with a tuning shaft connected to a motor driven drive train for rotating the tuning shaft varying the capacitance of the variable vacuum

capacitor thereby, the motor driven drive train having at least a first drive means and an energy absorbing means comprising;

a friction plate;

a mounting means for mounting the friction plate to the first drive means and separating the mounted friction plate from first drive means by first predetermined distance;

a wedge member of a thickness that is at least equal to the first predetermined distance; and

activate means for placing the wedge member between the friction plate and the drive means so that, when the first drive means is rotating and the wedge member is placed betweeen the friction plate and the first drive means, the friction between the wedge member and the friction plate acts to retard the rotation of the first drive means.

9. A drive train having at least a first drive means and an energy absorbing means comprising an end stop;

a friction plate;

a mounting means for mounting the friction plate to the first drive means and separating the mounted friction plate from the first drive means by first predetermined distance;

a wedge member of a thickness that is at least equal to the first predetermined distance; and

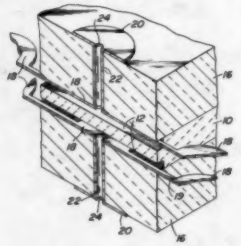
activate means for placing the wedge member between the friction plate in the drive means so that, when the first drive means is rotating and the wedge member is placed between the friction plate and the first drive means, the friction between the wedge member and the friction plate acts to retard the rotation of the first drive means.

4,390,925

MULTIPLE-CAVITY VARIABLE CAPACITANCE PRESSURE TRANSDUCER

Paul J. Freud, Furlong, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Aug. 26, 1981, Ser. No. 296,290
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 **11 Claims**



7. A pressure transducer of the capacitor type comprising:

a wafer of inorganic electrically insulating material having a plurality of interconnected electrically conductive surfaces deposited over spaced portions of one surface of said wafer to form a capacitor plate thereon;

a semiconductor diaphragm structure having a plurality of spaced recesses, said structure being electrostatically bonded to said wafer so as to form with said wafer a plurality of cavities with the conductive surfaces of said wafer facing said diaphragm structure; and

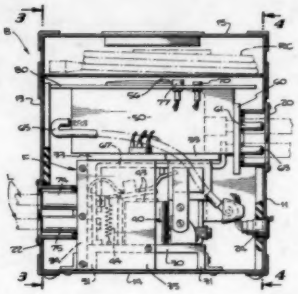
means providing fluid communication between said cavities so that the diaphragm structure acts as an opposing capacitor plate responsive to the application of changes in the fluid pressure in the cavities so as to change the capacitance between the diaphragm structure and the conductive area as an indication of the magnitude of the pressure change.

4,390,926

PORTABLE SWITCHING UNIT

Randall A. Hart, North Hollywood, Calif., assignor to Lexus Liting, Inc., Los Angeles, Calif.

Filed May 1, 1981, Ser. No. 259,460
Int. Cl.³ H02B 1/10
U.S. Cl. 361—334 **2 Claims**



1. A remotely controlled portable heavy duty electrical switch including:

a lower base plate, having two ends and corresponding feet for maintaining the base plate in an elevated position;

a pair of magnetic contactors which rest on top of the lower base plate and are secured to it, each contactor having an input terminal and an output terminal, both input terminals being located at one end of said lower base plate and the output terminals being located at the other end of said lower base plate;

an upper base plate disposed above the magnetic contactors and having associated sidewall means which extend downwardly towards and are secured to the lower base plate;

a circuit breaker box disposed upon and secured to said upper base plate, said circuit breaker box containing two interruptible circuits and also having a mechanical reset switch on its exposed upper surface;

an input terminal board carrying a set of three input terminals and secured to one end of said breaker box above said one end of said lower base plate, the first and third input terminals being connected to respective ones of said interruptible circuits;

a pair of heavy duty electrical conductors each connected to a corresponding interruptible circuit at the other end of said circuit box, said conductors extending around corresponding lateral sides of said circuit box to locations beneath said input terminal board and being there connected to input terminals of corresponding magnetic contactors;

a third heavy duty electrical conductor connected to the second one of said terminals on said input terminal board and extending underneath said circuit breaker box and between said magnetic contactors to the other end of said contactors;

an output terminal board secured to the other end of said lower base plate and carrying at least one set of three output terminals, the first and third output terminals being connected to output ends of respective ones of said magnetic contactors, and the third output terminal being connected to said third heavy duty conductor; and

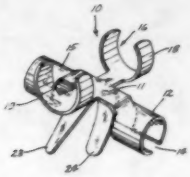
each of said magnetic contactors having a normally open pair of contact plates, and coil means energizable for closing said plates so as to energize a corresponding pair of said output terminals.

4,390,927

BICYCLE FLASHLIGHT HOLDER

Donald E. Von Feldt, R.R. 1, Duncombe, Iowa 50532

Filed May 19, 1982, Ser. No. 379,928
Int. Cl.³ F21V 33/00
U.S. Cl. 362—72 5 Claims



1. Apparatus for selectively attaching a flashlight to bicycle handlebars, said bicycle handlebars being of a type having a central generally vertically extending shaft, a generally upwardly and horizontally forwardly extending connection structure connected to the top of the shaft, and a bar connected to the top front portion of said connection structure and extending to each side of said connection structure for providing handles for steering a bicycle, said apparatus comprising:

a base portion adapted to be disposed near the front top portion of the connection structure and overlying the center of said bar;

a first resilient downwardly extending clamp means attached to one side of said base portion for extending around more than half of the circumference of a section of said bar on one side of said connection structure and for resiliently holding one end of said base portion in place;

a second resilient downwardly extending clamp means attached to the other side of said base portion for extending around more than half of the circumference of a second section of said bar on the other side of said connection structure for resiliently holding the other side of said base portion in place;

an upwardly extending flashlight clamping means attached to said base portion for extending around at least half of the circumference of a flashlight for holding a flashlight in place while the bicycle is being ridden; and

rotation prevention means attached to said base portion and extending above and below said connection structure for preventing said base portion and thereby said flashlight from rotating out of a predetermined position, whereby a bicycle can be ridden at night by using said apparatus with a common flashlight as a headlight.

4,390,928

CONTAINER

Hermann Runge, Regensburg-Mintraching, Fed. Rep. of Germany, assignor to Boerung-Gebrauchsartikel GmbH, Regensburg, Fed. Rep. of Germany

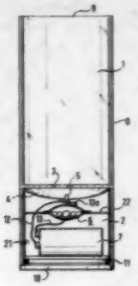
Filed Jul. 31, 1981, Ser. No. 288,781
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111102
Int. Cl.³ F21V 33/00
U.S. Cl. 362—101 19 Claims

1. A container for a liquid comprising:

first and second chambers having a divider means therebetween for separating the chambers,

a light means in the second chamber, the light means including a reflector, a light bulb passing through the reflector, a power source electrically connected to the light bulb, and a switch means electrically connected between the light bulb and power source,

wherein the switch means comprises two electrically conductive shell portions with a space therebetween and insulating means separating the shell portions; and at least



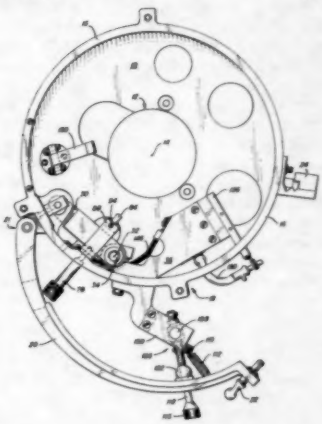
one movable, electrically-conductive contact means in the space.

4,390,929

PRECISE LAMP POSITIONER

Carlo F. La Fiandra, New Canaan, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 11, 1981, Ser. No. 262,561
Int. Cl.³ F21S 5/00
U.S. Cl. 362—216 14 Claims



1. An assembly for precisely positioning a lamp comprising, in combination:

a base;

a door pivotally coupled to said base;

a pivot arm pivotally coupled at one end thereof to said base;

a pivot arm adjustment means for adjusting the position of the free end of said pivot arm with respect to said pivot base;

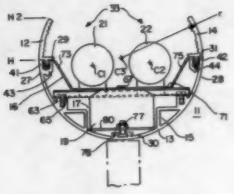
a pivot plate pivotally coupled about a pivot axis to said free end of said pivot arm, said pivot plate including lamp support means; and

a pivot plate adjustment means coupled between said pivot plate and said door to adjustably position said pivot plate with respect to said pivot arm to which said pivot plate is coupled while said door remains in one position and to pivot said pivot plate about said pivot axis when said door is moved relative to said base.

4,390,930
INDIRECT LIGHTING FIXTURE WITH IMPROVED LIGHT CONTROL

Douglas J. Herst, Ross, and Peter Y. Y. Ngai, Danville, both of Calif., assignors to Herst Lighting Co., Berkeley, Calif.

Filed Apr. 15, 1981, Ser. No. 254,462
Int. Cl.³ F21S 3/0
U.S. Cl. 362—224 18 Claims



1. An indirect lighting fixture having a cross-sectional dimension of approximately 6 inches comprising

a light source,

an opaque housing having opaque side wall portions which extend upwardly from beneath said light source,

side lens means attached to the opaque side wall portions of said housing and extending upwardly therefrom to form a light transmitting extension thereof, said side lens means being formed to receive light from said light source and direct same substantially laterally of said fixture such that the greatest portion of the light travelling through said lens is directed above said horizontal plane and a small portion of the light travelling through said lens is directed below said horizontal plane, said portion of light directed below said horizontal plane of said fixture being great enough to provide a perception of seeing a light source when an observer views the fixture above but near eye level and small enough to avoid excessive brightness,

said light source being vertically elevated within said housing relative to the side walls thereof a sufficient distance to permit a small portion of light emanating from the light source to be directed below said horizontal plane by said side lens means, and

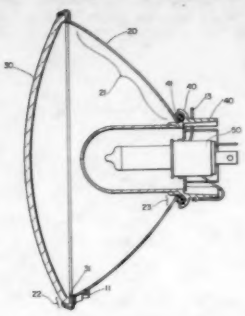
reflector means in said housing beneath said light source for reflecting light therefrom generally upwardly so as to increase the amount of light directed out of said fixture.

4,390,931
LAMP ASSEMBLY

Joel C. Gorick, 10416 Windsor View Dr., Potomac, Md. 20854, and Riley H. Mayhall, Jr., Burtonsville, Md., assignors to Joel C. Gorick, Potomac, Md.

Filed Jul. 11, 1980, Ser. No. 168,669
Int. Cl.³ F21V 29/00
U.S. Cl. 362—267 5 Claims

1. A lamp assembly comprising a sealed optical system including a lens, reflector and enclosed bulb mounting means so that the volume confined between the lens, reflector and bulb mounting means is hermetically sealed, said bulb mounting means comprising a cup shaped element fitted within a central opening in said reflector, at least the inner end portion of said cup shaped element being made of light transmitting material, the outer end portion of said cup shaped element being open to receive a light bulb and means for retaining a bulb within said

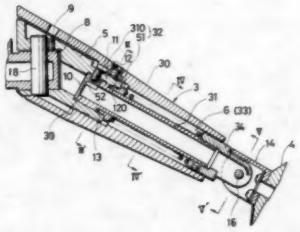


bulb mounting means without invading the hermetically sealed volume.

4,390,932
HANGER ARM MECHANISM IN DENTAL LIGHTING EQUIPMENT

Takahiro Matsui, Uji, and Minoru Watanabe, Shinnaka, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Sep. 17, 1981, Ser. No. 302,976
Claims priority, application Japan, Jul. 3, 1981, 56-99744[U]
Int. Cl.³ F21V 21/26
U.S. Cl. 362—269 3 Claims



1. A hanger arm mechanism in dental lighting equipment including a horizontally movable arm, a vertically movable arm, a hanger arm and a lamp head, said mechanism being characterized in that said hanger arm comprises:

a hanger arm body made of a pipe member;

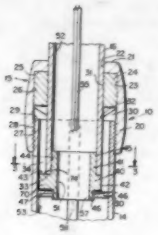
a rotary member, said rotary member being provided in the front portion of said hanger arm body and vertically movable with the lamp head and being inserted into and coupled to said hanger arm body so as to be freely rotatable about the axis shaft line of the hanger arm body; and

a friction adjusting member, said member being adapted to change the rotating slide contact portion formed in said rotary member and the friction force of said contact portion for affecting rotation of said rotary member under pressure contact friction.

4,390,933
MULTIPLE POSITION LAMP

Jerome Warshawsky, Baldwin, N.Y., assignor to I. W. Industries, Inc., Melville, N.Y.

Filed Dec. 11, 1980, Ser. No. 215,507
Int. Cl.³ F21V 21/22, 21/26; F21S 1/12, 3/12
U.S. Cl. 362—270 6 Claims



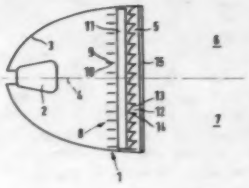
1. A multiple position lamp comprising;
a base;
a telescopic body mounted to said base, said body including first and second tubular members, said first member being fixed to said base and being formed with a longitudinal rib on an interior surface thereof, said second tubular member being telescopically received within said first tubular member and being rotatably movable to said first tubular member, a ring being disposed within said first tubular member and being formed of a groove for slidably receiving said rib for vertical movement; and a block member, and means to connect said block member to said second tubular member and means to connect said block member to said ring, said block member being formed with a radial flange for abutting said rib in rotation of said second tubular member in said first tubular member so as to limit rotational movement of said second tubular member relative to said first tubular member to less than 360°; said ring being of annular configuration and having an outer circumference slidably disposed with said first tubular member and an inner circumference slidably disposed with said block member;
a receptacle adapted to receive a lamp; and means for mounting said receptacle to said second tubular member for movement therewith; further comprising a collar, said collar being disposed around said tubular members and being formed with means to releasably interconnect said tubular members; whereby on releasing said tubular members said second member vertically slides with said block member on the rib of said first member and rotates within the block member until said flange abuts said rib; said rib having parallel sides, and said flange being formed with a circumferential outer surface for slidably engaging the inside of said first member and parallel side surfaces for abutting said rib.

4,390,934
SIGNAL LAMP

Achim Willing, Doschendorf, Fed. Rep. of Germany, assignor to Auer-Sog Glaswerke GmbH, Bad Gandersheim, Fed. Rep. of Germany

Filed May 26, 1981, Ser. No. 267,079
Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020097
Int. Cl.³ F21V 7/00
U.S. Cl. 362—291 10 Claims

1. A signal lamp having a light source, light bundling optics arranged to receive light from the light source, a dispersion sheet carrying dispersion elements adapted to receive the light, strips horizontally arranged between the light source and the dispersion shield evenly spaced from one another having their upper sides light absorptive with respect to incident outer stray light characterized in that
the interval "h" between adjacent strips **8** corresponds substantially to the height of a single given dispersion element **12**; and
the horizontal strips **8** are arranged coincidentally with the

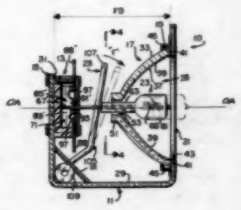


transition from one dispersion element **12** to the next adjacent dispersion element **12**; and
the dispersion elements **12** are constructed such that light "L" which contacts them from above or in the horizontal direction is bent more severely downward when the light contacts the upper zone of the dispersion element than when it contacts the lower zone of the dispersion element.

4,390,935
PROJECTION UNIT WITH SEPARABLE LAMP CAPSULE AND MEANS FOR EJECTING SAME

Emery G. Audesse, Beverly, Mass.; George B. Kendrick, and Pratap P. Chavan, both of Lexington, Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 13, 1981, Ser. No. 253,332
Int. Cl.³ F21V 7/00
U.S. Cl. 362—306 19 Claims



1. A projection unit comprising:
a holder including front and rear upstanding portions, said front upstanding portion defining an opening therein and including a forward reference surface thereon;
a socket positioned on or forming part of said rear upstanding portion of said holder, said socket defining a rear reference surface thereon, said rear reference surface located at a predetermined, fixed distance from said forward reference surface on said front upstanding portion of said holder;
a reflector located within said holder, said reflector having a concave reflecting portion defining a forward aperture and including a front reference surface thereon, and a rear apex portion defining an opening therein, said front reference surface of said reflector mating with said forward reference surface of said holder in a preestablished manner whereby said forward aperture of said reflector is aligned with said opening within said front upstanding portion;
a lamp removably positioned within said socket and oriented in a non-contacting relationship with said reflector, said lamp including an envelope portion located substantially within said concave reflecting portion of said reflector

when said lamp is positioned within said socket, a sealed end portion adjacent said envelope portion and located substantially within said opening within said rear apex portion of said reflector when said lamp is positioned within said socket, and a pair of lead-in wires located within said sealed end portion of said lamp and having portions thereof projecting from said sealed end portion, said lead-in wires electrically connected to said socket, at least one of said wires being positioned within said socket in contact with said rear reference surface of said socket when said lamp is positioned within said socket; and

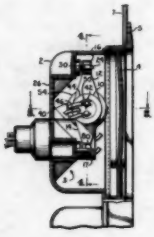
means for ejecting said lamp from said holder whereby said lamp will pass through said forward aperture of said reflector and said opening within said front upstanding portion of said holder, said means for ejecting said lamp comprising an arm member pivotally oriented on said holder, said arm member engaging said lamp to effect said ejection thereof.

4,390,936

RESILIENT SUSPENSION MOUNT

Charles A. Slater, Jr., Overland Park, Kans., and Spencer A. Darby, Kansas City, Mo., assignors to Peterson Manufacturing Co., Grandview, Mo.

Filed Feb. 2, 1981, Ser. No. 230,661
Int. Cl.³ F21V *15/04*
U.S. Cl. 362—390 **18 Claims**



1. A suspension mount for supporting a filament-type bulb on an associated lamp structure having first and second attachment members in such a manner so as to inhibit the transfer of vibrations to said bulb from said lamp structure; said mount comprising:

(a) a bulb receiving cup adapted to receive the bulb therein;

(b) first and second spaced resilient arms extending outwardly from the cup, said respective arms each including apertures at distal ends thereof each of said arm distal ends being engageable with an associated attachment member, said arms urged onto said respective associated attachment members by interferingly receiving said respective attachment member within said respective associated arm aperture, said arms being frictionally and removably retained thereon allowing selective removal of said suspension mount from said lamp structure.

4,390,937

SELF-STARTING TRANSFORMER-COUPLED FET MULTIVIBRATORS

Charles A. Clark, Jr., Chatsworth, Calif., assignor to RCA Corporation, New York, N.Y.

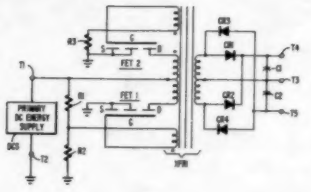
Filed Jun. 17, 1981, Ser. No. 274,624
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—22 **12 Claims**

10. In a transformer-coupled multivibrator in which a first and a second field effect transistor have alternately conducting channels connected to provide push-pull drive to the primary winding of a transformer, which transformer has a core of magnetically saturable material, the improvement providing for self-starting of the multivibrator which comprises:

means for applying between the source and gate electrodes of said first field effect transistor a first source-to-gate potential having a quiescent component and a dynamic component, including

means applying as the dynamic component of said first source-to-gate potential a potential proportionally responsive by a first factor to the potential across said primary winding for completing a first regenerative feedback connection, and including

means applying as the quiescent component of said first source-to-gate potential a direct potential conditioning the channel of said first field effect transistor to be conductive at start-up; and



means for applying between the source and gate electrodes of said second field effect transistor a second source-to-gate potential having a quiescent component and a dynamic component, including

means applying as the dynamic component of said second source-to-gate potential a potential proportionally responsive by a second factor to the potential across said primary winding, which second factor is larger than said first factor, and including

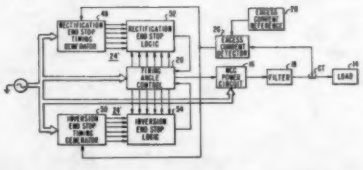
means applying as the quiescent component of said second source-to-gate potential a direct potential conditioning the channel of said second field effect transistor to be relatively non-conductive at start-up.

4,390,938

CYCLOCONVERTER APPARATUS WITH CONTROLLABLE END STOP FIRING PULSE CONTROL MEANS

Eric J. Stacey, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 95,803, Nov. 19, 1979, Pat. No. 4,309,752.
This application Jun. 11, 1981, Ser. No. 272,597
Int. Cl.³ H02M *1/08*
U.S. Cl. 363—54 **3 Claims**



1. End stop firing pulse control circuitry, for power conversion apparatus that has naturally commutated gated power switches to which firing pulses are applied at appropriate times, comprising:

means for generating digital timing waveforms phase locked with applied phase voltage waveforms during normal converter operation and shifted in timing upon application of a control signal;

logic circuit means for processing said digital timing waveforms with digital shift register outputs of an integral type firing pulse control circuit to produce inhibiting or forcing

end stop firing pulses to said power switches in response to a shift in said timing waveforms; and

means for sensing a variable system parameter that is independent of the voltage source and producing a control signal applied to said means for generating timing waveforms when said variable system parameter is outside predetermined limits.

4,390,939

ELECTRIC POWER SOURCE DEVICE

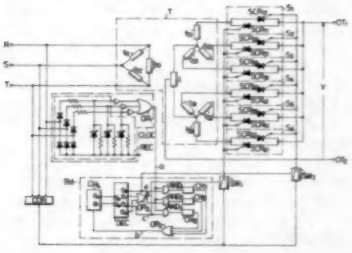
Isao Sugawara, Warabi, Japan, assignor to Kabushiki Kaisha Chiyoda, Japan

Filed Jul. 7, 1981, Ser. No. 281,085

Claims priority, application Japan, Oct. 14, 1980, 55/142387

Int. Cl.³ H02M 7/155

U.S. Cl. 363—129 **4 Claims**



1. An electric power source device in which the secondary windings of a transformer having the primary windings connected to an alternating current source are connected to output ends through reverse parallel circuits of thyristors including at least one thyristor having a first polarity with respect to the output ends and at least one thyristor having a second opposite polarity with respect to the output ends, the device comprising:

(a) a phase controlling circuit connected to said alternating current source and generating a signal driving said thyristors at a predetermined phase of the alternating current source,

(b) a plurality of analogue switches inserted between said phase controlling circuit and the thyristors, at least one of said analog switches being connected to the thyristors having the first polarity and at least one other of said analog switches being connected to the thyristors having the second opposite polarity,

(c) a clock signal generating circuit connected to the alternating current source and generating pulses at a predetermined phase of the alternating current source, and

(d) a timer circuit connected to said clock signal generating circuit and selectively opening and closing said plurality of analogue switches at a first time interval wherein only the analog switches enabling the thyristors having the first polarity are closed, a second time interval wherein only the analog switches enabling the thyristors having the second reverse polarity are closed, and a third time interval wherein all of the analog switches are open.

4,390,940

PROCESS AND SYSTEM FOR PRODUCING PHOTOVOLTAIC POWER

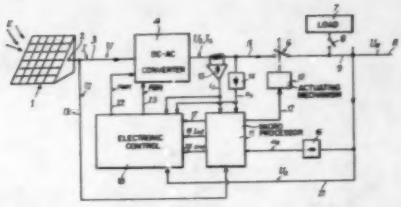
Rene Corbefin, Mondonville, and Gabriel Vacelet, Pibrac, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jun. 12, 1981, Ser. No. 273,267

Claims priority, application France, Jun. 26, 1980, 80 14235

Int. Cl.³ H02M 7/537

U.S. Cl. 363—132 **10 Claims**



6. A system for producing photovoltaic power comprising an assembly of photovoltaic cells and a D.C.-A.C. converter transforming the D.C. power produced by said assembly into A.C. power, wherein said converter is controlled by a control signal which determines the rate of conversion of the D.C. power into A.C. power, and said system further comprises

a modulator delivering at its output a modulated signal acting as control signal for said converter and of which the rate of modulation regulates said rate of conversion,

a processor for determining by iteration the modulation rate which results in maximum power available at the output of said converter and

means for imposing said modulation rate on said modulated signal.

4,390,941

STATIC MAGNETIC FREQUENCY MULTIPLIES

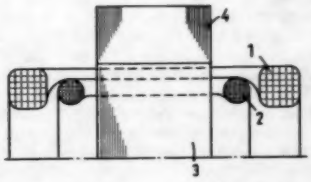
Wilhelm Benecke, Bad Neustadt, Fed. Rep. of Germany, and Heinz Rosenberg, Vienna, Austria, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,575

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913612

Int. Cl.³ H02M 5/32

U.S. Cl. 363—174 **10 Claims**



1. A static magnetic frequency multiplier comprising:

laminated iron structures forming a closed magnetic circuit, at least one of the structures comprising slots between teeth;

a polyphase primary winding, distributed in the slots and having a number of pole pairs p_1, the winding being such that a voltage will be induced at its terminals substantially only by the fundamental of a field having the pole pair p_1; and

a secondary winding distributed in slots in one of the structures and magnetically coupled to the primary winding, the secondary winding having a number of pole pairs p_2,

where p_2 is an uneven multiple of p_1, the second winding being such that no voltage can be induced at its terminals by the fundamental of a field having the pole pair number p_1;

the iron structures having at least one magnetic return path at least a portion of which is subjected to pronounced magnetic saturation by the magnetic field produced by the primary winding when it is supplied with the nominal primary voltage at the nominal frequency while the teeth remain unsaturated.

4,390,942

CONTROL SYSTEM

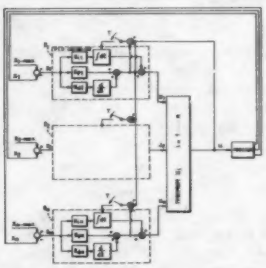
Cornelis de Keizer, Dordrecht, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Oct. 16, 1980, Ser. No. 197,536

Claims priority, application Netherlands, Oct. 19, 1979, 7907723

Int. Cl.³ G05B 11/42; G06G 7/66

U.S. Cl. 364—162 **1 Claim**



1. Control system for controlling the variables of a process, comprising at least two proportional-integral-differential controllers each comprising a linear signal path, a differentiating signal path and an integrating signal path, all connected to an input junction, the outputs of the linear signal path and the differentiating signal path being added at an intermediate junction and the resulting sum signal is added to the output signal of the integrating signal path at an output junction, each proportional-integral-differential controller supplying an output suitable for controlling one of the process variables such that said process variable is maintained as close as possible to a predetermined maximum value without any of the other process variables exceeding its respective predetermined maximum value, the difference between the value of each of the process variables and the maximum value applying to each of said respective process variables being supplied to a separate proportional-integral-differential controller assigned to the associated process variable, the outputs of all controllers being supplied to a comparator circuit, which comparator circuit delivers the smallest of these signals through feedback signal paths to a difference junction in each controller, the difference being formed as a difference signal between the comparator output and said sum signal at the said intermediate junction in the associated controller, and means whereby said difference signal is periodically sampled and used for periodically resetting the integrating circuit in the integrating signal path in each controller.

4,390,943

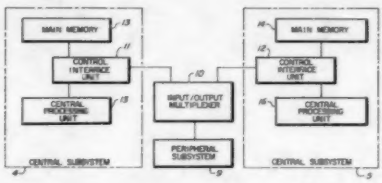
INTERFACE APPARATUS FOR DATA TRANSFER THROUGH AN INPUT/OUTPUT MULTIPLEXER FROM PLURAL CPU SUBSYSTEMS TO PERIPHERAL SUBSYSTEMS

Jerome J. Twibell, and Knute S. Crawford, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 26, 1979, Ser. No. 106,779

Int. Cl.³ G06F 3/00, 13/00, 15/16

U.S. Cl. 364—200 **9 Claims**



1. In a data processing system in which a plurality of central processing unit subsystems transmit data signal groups to peripheral subsystems through a single input/output multiplexer, wherein processing unit data signal groups are applied to output terminals of each central processing unit subsystem, a set of said data signal groups from a particular central processing unit subsystem being separated by at least one system timing cycle from each other set of data signal groups from said particular subsystem, apparatus in said input/output multiplexer for receiving data signal groups from said plurality of said central subsystems comprising:

a plurality of transfer registers, one coupled to each of said central processing unit subsystems, each of said transfer registers including an indicating register cell indicating the presence of a data signal group awaiting transfer from said coupled transfer register;

a switch means coupled to said transfer registers;

an input register coupled to said switch means for receiving each data signal group applied to said input/output multiplexer during a current system timing cycle; and

control means adapted to receive signals from all of said indicating register cells, said control means also adapted to receive system timing signals, wherein said control means determines a current transfer register of said transfer registers through which data signal groups can be transferred during said current system timing cycle by means of address signals applied to said switch means, said address signals determined by said register cell contents, wherein a new current transfer register can be determined by said control means during a one of said separations between said sets of data groups.

4,390,944

SYSTEM FOR CONTROLLING ACCESS TO A COMMON BUS IN A COMPUTER SYSTEM

William L. Quackenbush, Palo Alto; Stephen C. Porter, Los Gatos, and William P. Cargile, Half Moon Bay, all of Calif., assignors to BTI Computer Systems, Sunnyvale, Calif.

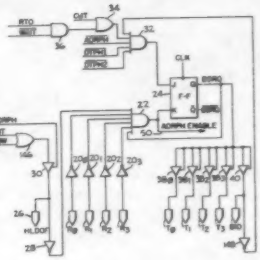
Filed May 13, 1980, Ser. No. 149,485

Int. Cl.³ G06F 9/46

U.S. Cl. 364—200 **5 Claims**

1. A system for controlling access to a multiconductor common bus having 2^n connectors for effecting connection of a corresponding number of circuit devices to the bus, wherein n is a positive integer greater than 1, a plurality of circuit devices engaged with respective said connectors so as to establish connection between the devices and the bus, a clock pulse source for producing successive time quantums, and means for coupling said clock pulse source to said devices, the connectors each having a unique code identification and being posi-

tionally ranked on the bus from superior to inferior so that a device engaged with a given connector is positionally ranked and identified in correspondence with the given connector, said system comprising n associated pairs of priority terminals in each connector, one terminal of each said pair being a transmit terminal and the other being a receive terminal, said pairs of terminals being grouped into n groups wherein each group contains a number of terminal pairs equal to the number of said connectors and wherein each pair in a connector is a member of only one group, each group being an i^{th} group wherein i has an integer value from 1 to n, the terminal pairs of each group being subsumed in one of 2^{n-i} sets, means interconnecting the transmit terminals of one half the pairs of each set to the receive terminals of the other half of the pairs in the set thereby to establish the devices engaged with the connector having



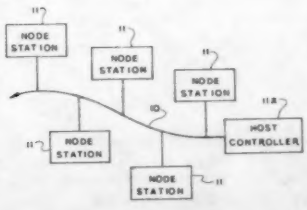
said one half the pairs as superior devices and the devices engaged with the connectors having other half of the pairs as inferior devices with respect to the superior devices bus signal request applying means carried on each said device for applying a bus request signal to all transmit terminals in the connector with which the device is engaged during a first time quantum so that devices engaged with connectors having receive terminals interconnected with transmit terminals to which the bus request signal is applied are established as inferior devices, each said device having means for sensing the receive terminals in the connector with which the device is engaged during said first time quantum, and means on each device coupled to said sensing means for establishing one of said devices as a source device in response to sensing simultaneous absence on all receive terminals in the connector with which the device is engaged of a bus request signal from a superior device.

4,390,945

SELF-MANAGING VARIABLE FIELD STORAGE STATION EMPLOYING A CURSOR FOR HANDLING NESTED DATA STRUCTURES

John D. Olsen, Escondido, Calif., and Stephen A. Allen, Wilmington, Del., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 25, 1980, Ser. No. 180,612
Int. Cl.³ G06F 7/22
U.S. Cl. 364—200 **3 Claims**



1. A variable field storage system for storing variable length data field segments including information structures having substructures nested therein, each such structure starting with a beginning delimiter character and ending with an ending delimiter character, said structures and substructures being capable of being nested to any level as determined by the number of beginning delimiter characters previously not matched by ending delimiter characters during a scanning of the stored field segments, said system comprising:

a serial periodic storage medium;

access means coupled to said storage medium for supplying at least data to said storage medium in a sequence of structures and substructures;

said access means including cursor address means for containing addresses specifying particular locations in the storage medium, said access means serving to supply a new data segment representing a structure or substructure at a location specified by said cursor address means.

4,390,946

LOOKAHEAD ADDRESSING IN A PIPELINE COMPUTER CONTROL STORE WITH SEPARATE MEMORY SEGMENTS FOR SINGLE AND MULTIPLE MICROCODE INSTRUCTION SEQUENCES

Thomas A. Lane, New Brighton, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 198,888
Int. Cl.³ G06F 9/22, 9/28, 9/38, 9/42
U.S. Cl. 364—200 **5 Claims**

1. A banked control store (10) for conditional branching in a pipeline computer comprising:

an address multiplexer (22) having input means for receiving original instructions in said pipeline computer, input means for receiving branch instructions, and input means for receiving increment instructions together with logic means for controlling the selection of an output of said address multiplexer said address multiplexer being responsive to said inputs to alter said original instructions in response to a predetermined condition,

a control store address register means (24) for receiving the output of said address multiplexer,

a single microinstruction memory means (92) for receiving the output from said control store address register and for producing a first microinstruction for controlling said pipeline computer as a memory output,

a multiple microinstruction memory means (96) for receiving the output from said control store address register and for producing a second microinstruction for controlling said pipeline computer as a memory output,

a memory select means (94) for receiving the outputs of said single microinstruction memory and said multiple microinstruction memory and having an output consisting of a selected memory output which is selected from said first microinstruction or said second microinstruction,

an output register means (34, 36, 48, 62, 74) for said memory select means,

a single microinstruction flip-flop (26) having an output for controlling said memory select means said flip-flop receiving an output from said address multiplexer,

a branch logic (54) network for producing a control output which is provided to said address multiplexer to cause said address multiplexer to alter said original instructions,

means for providing branch condition inputs (56) to said branch logic network,

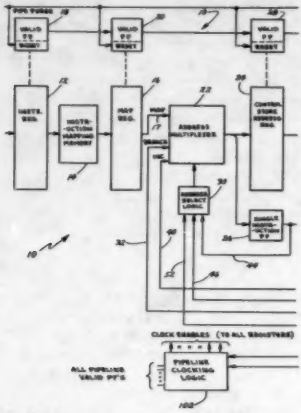
instruction register means for receiving program instructions,

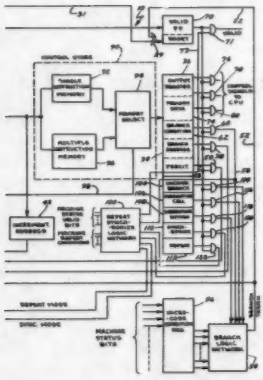
instruction mapping memory means for receiving instructions from said instruction register means,

instruction map register means for receiving the output of said instruction mapping memory means and connected to said input means for receiving original instructions of said address multiplexer, and

first through fourth valid flip-flops associated, respectively, with said instruction register means, said instruction map

register means, said control store address register means and said output register means, and wherein said first through fourth valid flip-flops control purging of said





register means, respectively, and wherein said branch logic network provides a control signal to at least one of said flip-flops in the event a branch is taken to purge the contents of the associated register.

4,390,947

SERIAL LINE COMMUNICATION SYSTEM

Wallace E. DeShon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 15,687, Feb. 27, 1979, Pat. No. 4,270,205. This application Dec. 16, 1980, Ser. No. 217,070

Int. Cl.³ G06F *3/00, 11/14*

U.S. Cl. 364—200 **5 Claims**

1. A serial line communication system comprising:

a central computer means;

a communications line controller computer means having the capability to format a message from said central computer means, add a sync pattern and error detection code to a message from said central computer means and change the baud rate at which a message from said central computer is transmitted;

means for interfacing said central computer means and said communications line controller computer means;

a first peripheral interface adapter;

means for interfacing said communications line controller computer means and said first peripheral interface adapter;

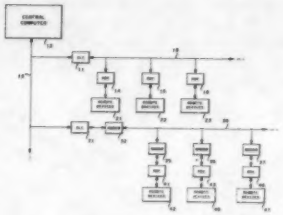
a serial communications line;

means for interfacing said serial communications line and said first peripheral interface adapter;

a second peripheral interface adapter means;

means for interfacing said serial communications line and said second peripheral interface adapter means;

a remote device controller computer means having the capability to determine the baud rate at which a message



is transmitted from said communications line controller computer means on said serial communications line and to detect errors in a message transmitted from said communications line controller computer means on said serial communications line;

means for interfacing said second peripheral interface adapter means and said remote device controller computer means;

at least one remote device; and

means for interfacing said remote device controller computer means to said at least one remote device.

4,390,948

NAVIGATION INSTRUMENT

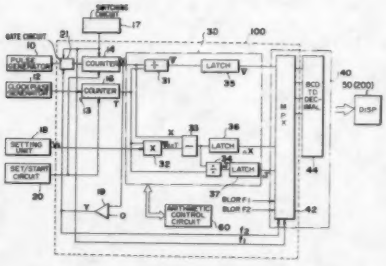
Kazuyuki Mori, Yokohama; Masanori Mizote; Hitoshi Takeda, both of Yokosuka; Kiyoshi Yamaki; Hidetaka Suzuki, both of Yokohama; Hiroyuki Nomura, Fujisawa, and Teruo Kawasaki, Yokohama, all of Japan, assignors to Nissan Motor Co. Ltd., Kanagawa, Japan

Filed Jun. 13, 1980, Ser. No. 159,198

Claims priority, application Japan, Jun. 14, 1979, 54/75458

Int. Cl.³ G06M *3/14;* G01C *22/00*

U.S. Cl. 364—424 **9 Claims**



5. A navigation instrument comprising:

distance detecting means for detecting travelling distance of a vehicle from a starting point and producing a signal showing the detected distance of travel of the vehicle, said distance detecting means selectively counting up and down the travelling distance;

manually operable switching means for switching operation

of said distance detecting means between counting up and down, said switch means producing a down count signal while it effects down counting operation;

stopping means for comparing a value counted down by said distance detecting means with a predetermined value and producing a stop signal to be fed to said distance detecting means for stopping counting operation thereof, said stopping means being responsive to said down count signal for sequentially comparing the counted value with said predetermined value while the down count signal is present;

time detecting means for detecting travelling time of the vehicle and producing a signal showing the length of time which it takes the vehicle to travel said detected distance;

setting means for setting a scheduled average speed of the vehicle;

arithmetic means for calculating the average travelling speed of the vehicle, the deviation of travelling distance from a scheduled distance and the deviation of travelling time from a scheduled time and, in response, generating three corresponding data signals;

signal selector means, responsive to a data selector command fed from said arithmetic means, for sequentially outputting one of said three data signals from said arithmetic means;

display means, responsive to each signal applied thereto from said signal selector means, for displaying the content of said each applied signal; and

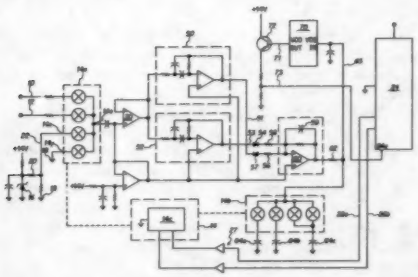
down count indicator means incorporated in said display means and responsive to said down count signal for indicating that the distance detecting means counts down the travelling distance while the down count signal is present.

4,390,949

ELECTRONIC SYSTEM AND METHOD FOR SELF-CALIBRATION OF INSTRUMENT LANDING SYSTEMS

Harley W. Beningfield, Satellite Beach, and Donna F. Wilt, West Melbourne, both of Fla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 26, 1981, Ser. No. 267,222
Int. Cl.³ G06G 7/78
U.S. Cl. 364—429 **23 Claims**



1. A method for correcting circuit induced errors in a navigation system of the type in which an operational input signal, having discrete spectral components each of known frequency and varying amplitude, is processed through frequency selective circuits in order to produce an output signal representative of deviation from a desired position, said method comprising the steps of:

A. generating a first test signal representative of a known first position, said first test signal including a plurality of spectral components having frequencies generally corresponding to those of the operational input signal and having known amplitudes;

B. processing said first test signal through the frequency selective circuits in order to derive a first position error corresponding to said known first position;

C. changing the amplitude of said spectral components of said first test signal so as to produce a second test signal representative of a second known position;

D. processing said second test signal through the frequency selective circuits in order to derive a second position error corresponding to said known second position;

E. deriving an error corrective function, effective over a range of operational input signals, from said first and second position errors; and

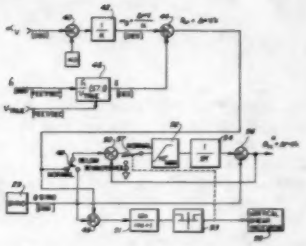
F. modifying the output signal from the frequency selective circuits with said error correction function for all subsequently processed operational input signals so as to correct for position errors introduced by processing.

4,390,950

ANGLE OF ATTACK BASED PITCH GENERATOR AND HEAD UP DISPLAY

Hans R. Muller, Redmond, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 28, 1980, Ser. No. 210,771
Int. Cl.³ G01C 23/00; G06G 7/78
U.S. Cl. 364—434 **20 Claims**



9. In a head up display for the operation of an aircraft having an angle of attack signal source, an air mass flight path angle signal source and a gyroscopic pitch signal source, a pitch calculating system for stabilizing the display of symbology generated by said head up display, comprising:

first means for combining said angle of attack signal with said flight path angle signal to obtain a first pitch signal having a long term component;

second means coupled to said gyroscopic pitch source and said first combining means for combining said gyroscopic pitch signal and said first pitch signal to develop a calculated pitch signal having a low frequency component dependent upon said long term component and having a high frequency component dependent upon said gyroscopic pitch signal;

a source of aircraft pitch signal referred to said head up display;

correction signal generating means for generating a correction signal from said aircraft pitch signal and said calculated pitch signal; and

third means for combining said correction signal and said calculated pitch signal to obtain a pitch stabilization signal for stabilizing said display.

4,390,951

APPARATUS FOR MONITORING ROAD TRAFFIC TO CONTROL AN ASSOCIATED SIGNALING SYSTEM

Raymond Marcy, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 3, 1980, Ser. No. 183,927
Claims priority, application France, Sep. 7, 1979, 79 22452
Int. Cl.³ G06F 15/48; G08G 1/00
U.S. Cl. 364—436 **10 Claims**

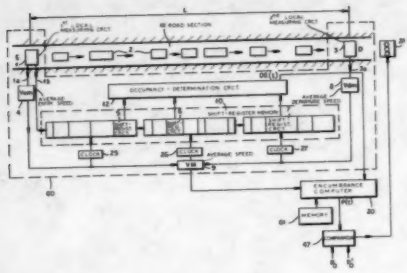
1. An apparatus for monitoring traffic on a road section of predetermined length L, comprising:

speed-sensing means disposed at said road section;

arithmetic means connected to said speed-sensing means for determining a mean overall speed VM of vehicles passing thereover;

pulse-generating means disposed at an entrance end of said road section for emitting trains of measuring pulses representing by their number the lengths Li of vehicles found entering said road section;

processing means connected to said arithmetic means and to said pulse-generating means for obtaining from said pulse



trains and from said mean speed VM a count of said measuring pulses representing the combined length ΣLi of vehicles simultaneously present on said road section and for deriving from said count an occupancy density $DE(t)=\Sigma Li/L$; and

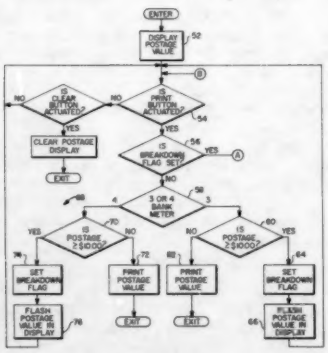
computer means connected to said processing means and to said arithmetic means for generating an output signal proportional to an encumbrance $P(t)=DE(t)/VM$ indicative of the degree of loading of said road section by vehicular traffic.

4,390,952

MAILING SYSTEM WITH SEQUENTIAL PRINTING CONTROL

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 27, 1980, Ser. No. 163,596
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—464 **8 Claims**



1. A method of enabling a mailing system to print a calculated postage value which exceeds the maximum digit printing capacity of its meter means, the system comprising meter means for imprinting a postage value and means operatively connected to the meter means for setting a postage amount to be printed, and control means for computing a postage value and controlling said meter means and said meter setting means, the method comprising the steps of:

(a) determining the maximum digit printing capacity of the meter means,

(b) comparing a calculated postage value for mailing an article with the determined maximum digit printing capacity,

(c) actuating the meter means to print the calculated value if the calculated value does not exceed the determined value, or

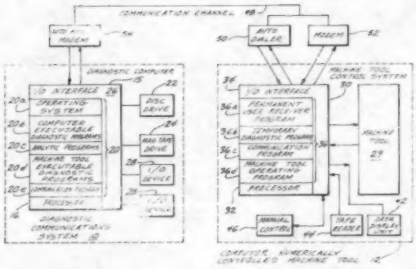
(d) actuating the meter means to sequentially print a succession of postage values, the sum of which corresponds to the calculated postage value if the calculated postage value exceeds the determine maximum value.

4,390,953

UNMANNED DIAGNOSTIC COMMUNICATIONS SYSTEM FOR COMPUTER CONTROLLED MACHINE TOOLS

Richard Johnstone, Brookfield, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 205,102, Nov. 10, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 281,019
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **7 Claims**



1. An unmanned diagnostic communication system for automatically analyzing the operation of a remotely situated computer controlled machine tool and for diagnosing abnormalities disclosed during machine tool operation comprising:

a diagnostic communication computer system including

means for automatically monitoring the operation of a remotely situated computer controlled machine tool following establishment of a communication link between the remotely situated computer controlled machine tool;

means for automatically selecting a predetermined diagnostic program in response to identifying data indicative of the machine tool type and for causing said program to be executed by said machine tool; and

means responsive to the receipt of data from said machine tool produced upon execution of said predetermined diagnostic program for automatically diagnosing any machine tool abnormalities in accordance with the said data produced by said machine tool upon execution of said predetermined diagnostic program;

a communication channel between said diagnostic communication computer system and the remotely situated computer controlled machine tool for carrying instructions from the diagnostic communication computer system to the remotely situated computer controlled machine tool to direct machine tool operation and for carrying data from the remotely situated computer controlled machine tool indicative of the machine tool type and indicative of machine tool operating characteristics to said diagnostic communication computer system; and

means coupled between said communication channel and

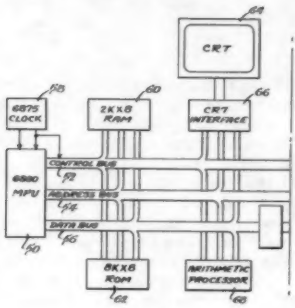
said diagnostic communication system and coupled between said communication channel and the remotely situated computer controlled machine tool for automatically establishing a communications link across said communication channel between said diagnostic communications system and a remotely situated computer controlled machine tool in response to a command generated by the remotely situated computer controlled machine tool.

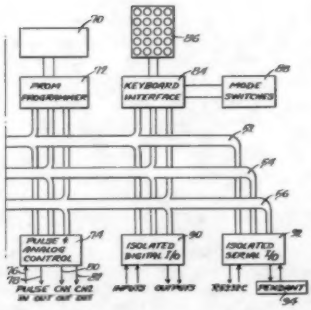
4,390,954

OVERRIDE CONTROL APPARATUS AND METHOD FOR PARAMETER ADJUSTMENT OF DIGITALLY BASED WELDING PROCESS PROGRAMMERS

Richard P. Manning, Nashville, Tenn., assignor to Merrick Engineering, Inc., Nashville, Tenn.

Filed Apr. 13, 1981, Ser. No. 253,861
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—477 **10 Claims**





1. Apparatus for controlling a welding control parameter for a welder during a welding process comprising:

storage means for storing program data representative of: a length of a time interval (T) over which welding is to occur,

an initial value of power (X0) to be supplied to a welding head at the beginning of said time interval, and

a target value of power (X1) to be supplied to a welding at the termination of said time interval;

manually actuable input means for changing said target value (X1) during said time interval;

calculating means for repetitively and frequently calculating, during said time interval, the instantaneous value of power X(t) to be supplied to a welding head according to the equation: $X(t)=(X1-X0)t/T+X0$, and for providing an output signal indicative of X(t);

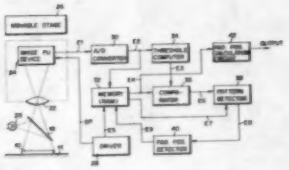
and weld power supply means responsive to the output value X(t) of said calculating means for supplying power to a weld head given by the value X(t), whereby the amount of power supplied to the welding head is calculated repetitively and frequently and whereby the adjustments for the amount of power supplied to the welding head can be made in real time during the welding interval.

4,390,955

POSITION DETECTING SYSTEM

Yoshiaki Arimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 231,781, Feb. 5, 1981, abandoned, which is a continuation of Ser. No. 77,781, Sep. 21, 1978, abandoned. This application filed Jun. 2, 1981, Ser. No. 269,756
Claims priority, application Japan, Sep. 28, 1978, 53-118588
Int. Cl.³ G01B *11/00*
U.S. Cl. 364—490 **17 Claims**



15. A chip position detecting apparatus comprising:

photographic means including an image pick-up means having a number of light sensing elements 2-dimensionally arranged on a given plane for photographing a chip provided on the surface with a bonding pad;

storage means for storing picture element information including a level distribution corresponding to an analog picture element signal produced from said image pick-up means;

level discrimination means for determining a first discrimination level for discriminating edges of said chip and second discrimination level for discriminating the bonding pad in a manner such that the picture element information is classified into proper groups in accordance with levels of the picture element information and a first mean value with a high level that is obtained on the basis of the given number of picture element information in the order from highest level to the lowest level and a second mean value with a low level which is obtained on the basis of a given number of picture element information in the order from the lowest level to the highest level;

edge video information detection means for obtaining edge video information corresponding to the edge of the chip by sequentially reading out information corresponding to the picture element information used to determine said first and second discrimination levels from said storage means in accordance with a pattern of light sensing elements of said image pick-up means and by comparing said information with said first discrimination level;

contour determining means for determining the contour or delineation of said chip from said edge video information;

calculating means for calculating a position of said bonding pad located at a known position relative to said chip contour or chip delineation determined;

bonding pad video information determining means for obtaining pad video information which represents the bonding pad by comparing picture element information corresponding to a position within a given range around the center of the bonding pad position calculated from picture element information and said second discrimination level; and

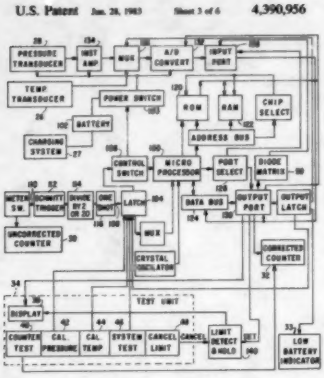
second calculating means for calculating a position of the bonding pad at a target pattern from said pad video information.

4,390,956

APPARATUS FOR CORRECTING MEASURED GAS FLOW

Malcolm W. Cornforth, Edgewater Park, N.J., and Robert S. Jacobsen, Hatboro, Pa., assignors to The Singer Company, Stamford CT

Filed Mar. 6, 1981, Ser. No. 241,328
Int. Cl.³ G01F 1/00
U.S. Cl. 364—510 17 Claims



1. Apparatus for recording the volume of gas flowing through a conduit, each measured unit volume being corrected to a base volume at given base conditions of base pressure and base temperature, said apparatus comprising:

means for measuring the volume of the flowing gas and providing a volume pulse in response to measuring said unit volume;

means responsive to said volume pulse for measuring the temperature of the flowing gas and providing a first electrical signal corresponding thereto;

means responsive to said volume pulse for measuring the pressure of the flowing gas and providing a second electrical signal corresponding thereto;

means for storing a first plurality of constant values;

means responsive to said volume pulse for utilizing said stored first plurality of constant values and the measured pressure and temperature values to calculate a second constant value;

means responsive to said volume pulse for utilizing said stored first plurality of constant values and the measured pressure value to calculate a third plurality of constant values;

means for utilizing said calculated third plurality of constant values and the measured pressure and temperature values to calculate a supercompressibility factor;

means for utilizing said supercompressibility factor and said second calculated constant value to calculate a correction factor;

means for deriving a corrected volume from the measured volume and the correction factor;

a counter;

means for converting said corrected volume into an integral number of increments for said counter plus a remainder;

means for storing said remainder; and

means for incrementing said counter by said integral number of increments;

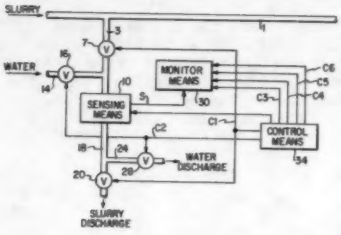
whereby a measured unit volume is corrected and recorded for every volume pulse.

4,390,957

COAL SLURRY MONITOR MEANS AND METHOD

Leonidas Skarlos, Beaumont, and Roger M. Dille, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,121
Int. Cl.³ G01N 27/46
U.S. Cl. 364—550 8 Claims



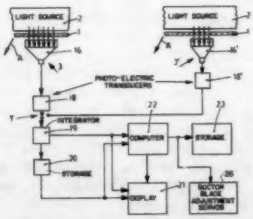
1. A monitor receiving a slurry of coal and water for providing an output signal corresponding to the weight by percent of the coal in the slurry comprising sensing means for sensing the hydrogen content of the water in the slurry and providing a corresponding signal, said sensing means utilizing low resolution nuclear magnetic resonance in its sensing, water signal means for providing a signal corresponding to the hydrogen content of water, output means connected to the sensing means and to the water signal means for providing the output signal corresponding to the coal content of the slurry in accordance with the signals from the sensing means and the water signal means, and source means for providing water through the sensing means in accordance with a first control signal, valve means receiving the slurry for providing the slurry through the sensing means in accordance with a second control signal; and in which the output means includes control signal means for providing the first and second control signals to the source means and to the valve means so that the sensing means will provide its signal corresponding either to the water or to the slurry depending on whether the slurry or the water is passing.

4,390,958

ELECTRO-OPTICAL MEASURING APPARATUS TO COVER ZONES OF DIFFERENT WIDTHS AND OBTAIN COMPUTED UTILIZATION SIGNALS FOR PRINTING APPARATUS

Hans E. Mamberer, Königsbrunn, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,034
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950606
Int. Cl.³ B41F 7/08
U.S. Cl. 364—550 12 Claims



1. In and for combination with a printing apparatus having

means for controlling application of ink to selected surface areas of an ink receiving surface,

apparatus for selective electro-optical measurement of zones of information coverage of selectively different widths on the surface of an elongated areal carrier, and deriving corresponding representative utilization signals, representative of the coverage of respective zones of the carrier by intelligence information which is optically contrasting with respect to said carrier, to permit determination of the degree of inking of regions of the surface area of the ink receiving surface, said apparatus comprising

an electro-optical transducing arrangement (2, 3, 16) providing an electrical signal representative of the relative distribution of information coverage in the respective zones of the surface areal carrier,

wherein the electro-optical transducing arrangement includes

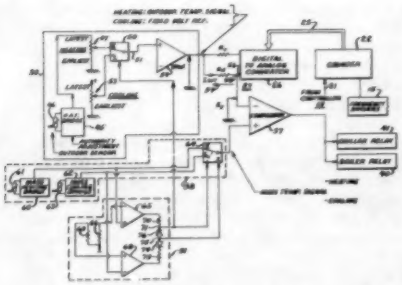
a plurality of light pick-ups divided into at least two groups, each group of pick-ups located in a row extending transversely to the carrier, and the rows being staggered longitudinally of the carrier, the pick-ups of the respective groups being positioned in the respective rows having individual different lengths to cover, respectively, zones of different widths on said carrier; and transfer switch means (T) selectively connecting the output from a respective group of pick-up to said ink application control means to provide signals to said ink application control means having a characteristic relative to the width of the respective zone of the carrier scanned by the pick-ups in the selected group, as selected and switched by said transfer switch (T).

4,390,959

OPTIMAL START PROGRAMMER

Christian G. Cabou, Highland Park, Ill., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Oct. 20, 1980, Ser. No. 198,667
Int. Cl.³ G06F *15/20*; G05D *23/00*
U.S. Cl. 364—557 **18 Claims**



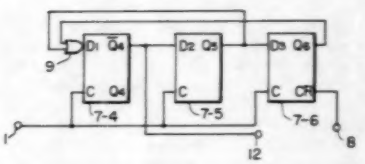
1. An optimal start programmer apparatus operable in a heating mode to generate an output command signal for actuating heating means, and operable in a cooling mode to generate an output command signal for actuating cooling means, said apparatus generating said output command signal during a predetermined search period prior to occupancy of the building, said apparatus comprising: mode selection circuit means responsive to an indoor mass temperature for the building for selecting an indoor mass temperature for the building for selecting the operating mode for the apparatus; timing source means for generating a periodic timing signal of known repetition rate; counter circuit means coupled to said timing source means enabled at the start of a search period to be responsive to said timing signal for generating digital signals representative of lapsed time from the commencement of the search period; converter circuit means coupled to said counter circuit means and responsive to said digital signals for generating an enabling signal representative of said digital signals; reference signal generating means controlled by said mode selection circuit means to provide a reference signal which varies as a function of outside air temperature when the apparatus is operating in the heating mode and to provide a reference signal which is independent of outside air temperature when the apparatus is operating in the cooling mode; means for receiving and summing the reference signal provided by said reference signal generating means and said analog signal to thereby generate a time variable set point signal which is representative of the outside air temperature when the apparatus is operating in the heating mode and which is independent of the outside air temperature when the apparatus is operating in the cooling mode and means for comparing said time variable setpoint signal with an indoor mass temperature signal and responsively generating said output command signal when the mass temperature signal and the time variable set point signal reach a predetermined relation.

4,390,960

FREQUENCY DIVIDER

Kiichi Yamashita, Hachiouji; Junichi Nakagawa, Tokotozawa, and Tadao Kaji, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 21, 1980, Ser. No. 209,112
Claims priority, application Japan, Nov. 21, 1979, 54-150083
Int. Cl.³ G06F *7/68*; H03K *21/32*
U.S. Cl. 364—703 **18 Claims**



1. A frequency divider comprising:

a counter constructed of one or more flip-flop circuits;

a shift register including an input terminal connected with an output terminal of said counter, an output terminal for providing a shift register output signal and a clear terminal responsive to a predetermined external control signal for varying the number of the frequency division of the frequency divider by forcing the shift register output signal at the output terminal to a zero condition; and

a feedback circuit for feeding an input terminal of the flip-flop circuit at the first stage of said counter with an OR signal comprised of the output of said counter and the output signal of said shift register.

4,390,961

DATA PROCESSOR PERFORMING A DECIMAL MULTIPLY OPERATION USING A READ ONLY MEMORY

Virendra S. Negi, Pepperell, and Steven A. Tague, Billerica, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 24, 1980, Ser. No. 220,218
Int. Cl.³ G06F *7/52*
U.S. Cl. 364—756 **16 Claims**

1. A decimal multiplying system for multiplying a multiplicand by successive decimal digits of a multiplier comprising:

first register means for storing decimal digits of said multiplicand;

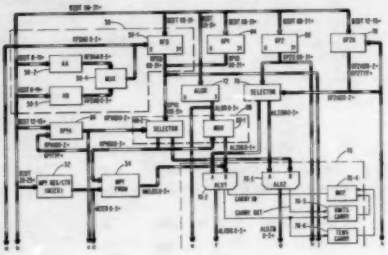
second register means for storing said multiplier decimal digits;

multiply register means coupled to said second register means for storing each of said successive multiplier decimal digits;

said second register means coupled to said first register means for storing said multiplicand decimal digits after said each of said successive multiplier decimal digits are stored in said multiply register means;

read only memory means coupled to said multiply register means and said second register means and responsive to a selected multiplier decimal digit and each of said multiplicand decimal digits for generating a units product decimal digit on a first cycle of operation and a tens product decimal digit on a second cycle of operation for said each multiplicand decimal digit;

third register means for storing partial product decimal digits;



adder means coupled to said read only memory means and said third register means and responsive to each of said units product decimal digit and a corresponding first partial product decimal digit during each of said first cycles of operation for generating a first sum decimal digit for replacing said first corresponding partial product digit in said third register means,

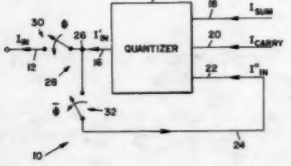
and responsive to each of said tens unit product decimal digit and a second corresponding partial product decimal digit during each of said second cycles of operation for generating a second sum decimal digit for replacing said second corresponding partial product digit in said third register means.

4,390,962

LATCHED MULTIVALUED FULL ADDER

Karl W. Current, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 25, 1980, Ser. No. 133,836
Int. Cl.³ G06F 7/49
U.S. Cl. 364—768 **14 Claims**



1. A synchronous latched multivalued full adder for processing a first input current having any one of a plurality of multivalues, comprising:

(a) quantizer means, having an input, a first sum output, a second carry output and a third output, for generating a sum logical output current at said first sum output and a carry logical output current at said second carry output in response to current being received at said input and for regenerating the received current in response to the sum logical output current and the received current at said input to produce a second regenerated current at said third output;

(b) first means for directing the first input current to said input of said quantizer means;

(c) second feedback means for directing the second regenerated current from said third output to said input of said quantizer means, and

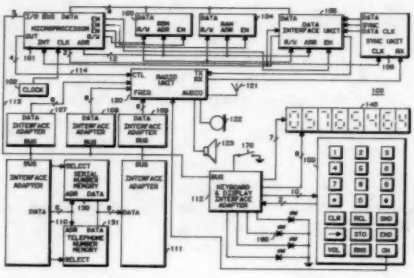
(d) clock controlled switch means for decoupling and coupling said first directing means and for coupling and decoupling said second feedback directing means, respectively, from said input of said quantizer means to direct the second regenerated current or the first input current to said input of said quantizer means as the received current.

4,390,963

INTERFACE ADAPTER ARCHITECTURE

Larry C. Puhl, Sleepy Hollow, and Paul A. Kasley, Melrose Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 15, 1980, Ser. No. 187,306
Int. Cl.³ G06F 3/04, 3/00
U.S. Cl. 364—900 **8 Claims**



1. Interface adapter circuitry coupled to a self-clocking serial data bus having binary first and second forward data signals for receiving a binary data signal including data, address and control portions, transmitted thereon, the first and second forward data signals having a first binary state before and after the data signal, the first forward data signal having a second binary state and the second forward data signal having the first binary state for data signal bits having a binary zero state, the first forward data signal having the first binary state and the second forward data signal having the second binary state for data signal bits having a binary one state, and the first and second forward data signals having the second binary state between successive data signal bits, said interface circuitry comprising:

generating means responsive to the second binary state of the first and second forward data signals for generating a clock signal;

latch means coupled to the first and second forward data signals for storing an output signal having a binary zero state in response to the second binary state of the first forward data signal and the first binary state of the second forward data signal, and storing an output signal having a binary one state in response to the first binary state of the first forward data signal and the second binary state of the second forward data signal;

receiving register means having a plurality of output signals and being responsive to the clock signal for serially receiving the latch means output signal;

output register means having a plurality of output signals and being responsive to a first control signal for receiving the data portion of the data signal in the receiving register means;

data direction register means having a plurality of output

signals and being responsive to a second control signal for receiving the data portion of the data signal in the receiving means;

interface means, having a plurality of interface signals, for applying each of the output register means output signals to a corresponding interface signal in response to a predetermined binary state of a corresponding data direction register means output signal;

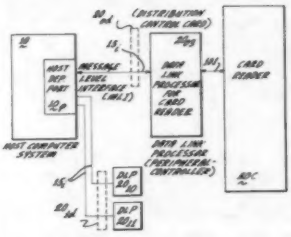
detecting means responsive to the adddress portion of the data signal in the receiving register means for detecting the presence of a predetermined address signal and generating a chip select signal when the predetermined address signal is detected; and

control means responsive to the chip select signal and the control signal portion of the data signal in the receiving register means for generating the first and second control signals.

4,390,964
INPUT/OUTPUT SUBSYSTEM USING CARD READER-PERIPHERAL CONTROLLER

Joseph F. Horky, Huntington Beach, and Ronald J. Dockal, San Clemente, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 9, 1980, Ser. No. 185,422
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—900 8 Claims



1. In a data transfer network wherein a main host computer system receives data from a peripheral card reader mechanism via the operations of an I/O subsystem, said I/O subsystem comprising:

(a) a message level interface bus providing parallel data transfer of 16-bit words, said interface bus connecting said host computer to a base module;

(b) a base module which includes:

(b1) a common backplane connecting a card-reader data link processor to a distribution control circuit card and to a maintenance circuit card;

(b2) said distribution control circuit card for controlling the connection and disconnection of said card-reader data link processor to said main host system via said interface bus, said connection and disconnection being regulated by control signals initiated by said main host system or said card-reader data link processor;

(b3) said card-reader data link processor operating to manage the read-out of data from said card reader mechanism, said data link processor having a dedicated connection means to said card reader mechanism, said data link processor including:

(b3a) common control circuit means which include:

(i) PROM control storage means for storing individually addressable micro-code word operators;

(ii) latching register means, connected to said PROM control storage means, to store and convey an accessed word operator to a peripheral dependent circuit means for execution;

(iii) sequencing means, initiated by said main host computer, for selecting address locations to access word operators in said PROM control storage means for executing commands from said main host system;

(iv) RAM buffer memory storage means for temporary holding of data being transferred from said card reader peripheral mechanism to said main host computer, said buffer storage means including:

(iv-a) a first dedicated memory portion for storing raw data received from said card reader mechanism;

(iv-b) a second dedicated memory portion for storing translated data which has been translated and formatted by a translation means in response to said accessed micro-code word operators;

(b3b) said peripheral dependent circuit means including:

(i) logic means for executing micro-code word operators received from said common control circuit means;

(ii) means, responsive to accessed micro-code word operators from said PROM control storage means, to generate control signals for said card reader peripheral mechanism and for said sequencing means;

(iii) data multiplexor means for selecting one of multiple sources of data to be stored in said RAM buffer storage means, said sources including:

(iii-a) translated and formatted data from said translation means;

(iii-b) raw untranslated data from said card reader mechanism via said RAM buffer storage means;

(iii-c) identification coded data to identify the particular type of data link processor used;

(iii-d) result-descriptor data to inform said main host system of the completion/incompletion of each task initiated by said main host system;

(iv) address register means for supplying addresses for the read-out and the write-in of data in said RAM buffer memory storage means, said address register means receiving address data from said PROM control storage means;

(v) data latching means for temporary storing the outputs of said data multiplexor means and for transferring data to:

(v-a) said distribution control circuit card for transfer to said main host system;

(v-b) an OP-decoder for decoding micro-code word operators and effecting execution of data transfers and translation commands;

(v-c) said maintenance circuit card for testing and checking said card reader data link processor;

(v-d) said RAM buffer storage means;

(vi) said translation means being controlled by said OP-decoder for receiving untranslated raw data from said first dedicated portion of said buffer memory storage means and functioning to translate said raw data into a selected code and selected format for transfer to said second dedicated portion of said memory storage means, for subsequent transmittal to said main host system;

(vii) said OP-decoder receiving instructions from said PROM control storage means and functioning to control said translation means and to provide branching instructions to said sequencing means;

(viii) jumper encoding means connected to said data multiplexor means to provide said coded data identifying the specific card reader data link processor;

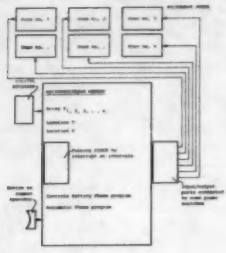
(ix) result register means, controlled by said micro-code word operators to generate said result descriptor data for transfer to said data multiplexor means;

(b4) said maintenance circuit card, which when initiated by said main host system, functions to test and check the operation of said card reader data link processor.

4,390,965
MICRO-WAVE OVENS

Lionel Albert, Westmount, Canada, assignor to Jovanita Inc., Westmount, Canada

Filed Jun. 5, 1980, Ser. No. 156,758
Int. Cl.³ G05B *19/02*; H05B *3/02*
U.S. Cl. 364—400 14 Claims

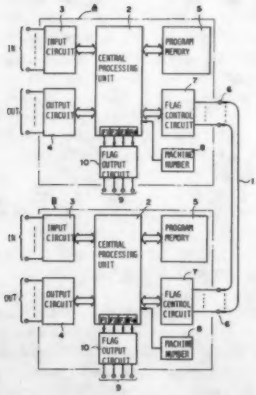


1. An electronic system for processing a plurality of portions of food in a like plurality of microwave ovens, comprising:
means for accepting and storing the time values representing the processing time of respective portions in respective ovens;
clock means;
means for selecting the longest of the said time values;
means for counting down the time remaining in said longest time value, as clocked off by the said clock means;
means for comparing, at predetermined intervals, each said time value, one at a time, with the said time remaining, and for turning on a respective oven when its time value is equal to the time remaining;
means for turning off all the ovens when the said time remaining has reached zero.

4,390,966
SEQUENCE CONTROLLER

Keisuke Kawashima, Nagaokakyo; Yoshitane Saito, Kameoka; Akihiro Yamada, Kyoto, and Satoshi Yano, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 15, 1980, Ser. No. 169,218
Claims priority, application Japan, Jul. 23, 1979, 54-93484
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—900 3 Claims

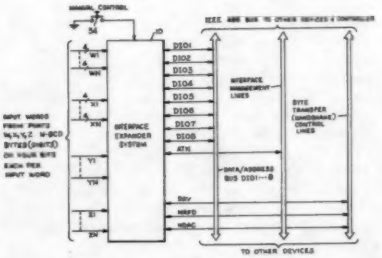


1. A sequence controller for carrying out process steps, which reads sequential user instructions which have been entered into a program memory by a user and then transmits a sequence of output statuses in response to statuses of inputs based on said user instructions, comprising:
a central processing unit;
a program memory operatively connected to said central processing unit;
an input circuit operatively connected to said central processing unit for receiving status inputs;
an output circuit operatively connected to said central processing unit for transmitting status outputs;
one or more flags controlled by predetermined user instructions, said flags being operatively connected to said central processor and utilized to show operational conditions;
a flag control input-output terminal connectable to a similar flag control input-output terminal of another similar sequence controller through a common bus;
flag control sending means operably connecting said central processing unit to said input-out terminal for sending out to said input-output terminal a flag control signal directed to another controller according to a predetermined user instructions; and
flag control signal receiving means, operably connecting said central processing unit to said input-output terminal for sequentially examining signals applied to said input-output terminal, and, when a flag control signal directed to the particular controller itself is applied, controlling a flag of that particular controller in accordance with said control signal.

4,390,967
INTERFACE SYSTEM WHEREIN THE INTERFACE IS ADDRESSED BEFORE DATA TRANSFER FROM A SELECTED DEVICE

Ira Eglowstein, and Peter E. Solender, both of Williamsville, N.Y., assignors to Interface Systems, Inc., Williamsville, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,661
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 10 Claims

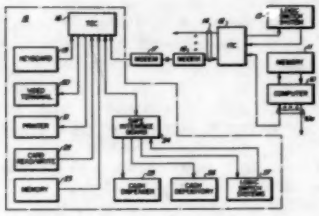


1. A system for expanding the number of ports which can be interconnected to a bus which enables digital messages to be exchanged among devices connected to said ports and other devices and a controller connected to said bus, said expanding system comprising means responsive to address messages transmitted along said bus which identifies said expanding system for selectively enabling listening to messages corresponding to different ones of said ports of said expanding system, and means responsive to said port identifying messages for enabling the sequential transmission of a predetermined number of bytes of data to said bus from the one of said different ports which is selectively enabled.

4,390,968
AUTOMATED BANK TRANSACTION SECURITY SYSTEM

Richard E. Hennessy, Marlboro; Roger Frymire, Cambridge, and Cary Coovert, Natick, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 30, 1980, Ser. No. 221,674
Int. Cl.³ G06F 15/30
U.S. Cl. 364—900 5 Claims



1. An automated banking system, including a central computer system located at a central site, which comprises:

(a) plural data entry means located at a like plurality of remote sites and responsive to customer initiated action for providing binary information signals representative of a personal identification number (PIN), an account number (ACCN), a bank identification number (BIN), a number having a predetermined relationship with said PIN (PIN OFFSET 1), transaction data descriptive of a desired banking transaction, and transaction limits;

(b) plural automated teller machines each located at any one of said remote sites and receiving said PIN, ACCN, BIN, PIN OFFSET 1, transaction data and transaction limits from an adjacent one of said plural data entry means for performing the following operations by way of signal paths wholly contained within said plural automated teller machines:

(1) validating said ACCN against resident binary customer account number codes,

(2) generating a first transaction identification number (TRAN 1), a transaction request (TREQ), a second transaction identification number as a function of TRAN 1 (TRAN 2'), and a number which is a function of PIN, BIN and ACCN (PIN OFFSET 2).

(3) comparing TRAN 2' and a third transaction number which is a function of TRAN 1 (TRAN 2),

(4) if TRAN 2 and TRAN 2' are equivalent, comparing PIN OFFSET 1 and PIN OFFSET 2, and

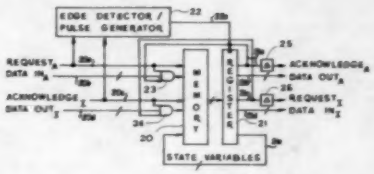
(5) if PIN OFFSET 1 and PIN OFFSET 2 are equivalent, dispensing transaction items to said customer and receiving transaction items from said customer in accordance with said transaction data; and

(c) plural controller means in electrical communication with said central computer system during on-line operations and in electrical communication with different pluralities of said plural automated teller machines during both on-line and off-line operations, and receiving TREQ, ACCN, TRAN 1 and said transaction limits from said plural automated teller machines for transfer to said central computer system during on-line operations, and for validating TREQ against said transaction limits and resident customer account information during off-line operations, and for generating TRAN 2 for transfer to a requesting one of said plural automated teller machines in the event TREQ is valid.

4,390,969
ASYNCHRONOUS DATA TRANSMISSION SYSTEM WITH STATE VARIABLE MEMORY AND HANDSHAKING PROTOCOL CIRCUITS

Alan B. Hayes, Salt Lake City, Utah, assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1980, Ser. No. 142,608
Int. Cl.³ G06F 3/00, 13/00
U.S. Cl. 364—900 4 Claims



1. An asynchronous binary circuit comprising:

a stored state circuit cell including a memory containing a state table of sets of state variables and an output register coupled to said memory to receive a current set of state variables;

said cell having a source input data line and a source request line coupled to said memory, said output register having output lines;

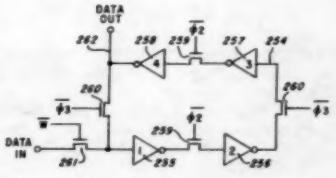
said output register being coupled to the input of said memory to address said memory along with said input data to fetch the next set of state variables; and

a pulse generator coupled to said source request line and having a timing line coupled to said output register, said pulse generator including delay means to delay the transmission of a timing signal to said output register a fixed period of time after the receipt of a binary signal transition on said source request line.

4,390,970
ROTATING REGISTER UTILIZING FIELD EFFECT TRANSISTORS

Brian Kay, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1980, Ser. No. 216,237
Int. Cl.³ G11C 19/00
U.S. Cl. 365—73 18 Claims



1. A storage register comprising:

an input means;

an output means;

a plurality of pairs of field effect transistor means and a plurality of pairs of clocking means arranged in a closed circuit loop having a first clocking means of a clocking means pair connected between the first and second field effect transistor means of a field effect transistor means pair, and having a second clocking means of the clocking means pair connected between each pair of field effect transistor means and having said input means connected between said first clocking means and said second field effect transistor means and having said output connected

between said second field effect transistor means and said second clocking means.

4,390,971

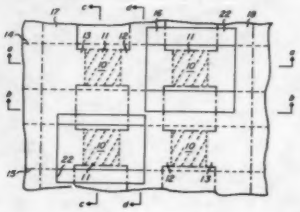
POST-METAL PROGRAMMABLE MOS READ ONLY MEMORY

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 890,555, Mar. 20, 1978. This application Jul. 20, 1981, Ser. No. 284,847

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—104 1 Claim



1. A read only memory array comprising: a plurality of memory cells formed at a face of a silicon body in an array of rows and columns; each memory cell including an insulated gate field effect transistor having a source, a drain and a gate, the gate being insulated from the silicon by a gate insulator; a plurality of other insulated gate field effect transistors formed at said face of the silicon body in an area peripheral to the array; a first thick silicon oxide insulating coating only on said area peripheral to the array covering the other field effect transistors except at contact areas; interconnections in the peripheral areas formed by metal strips on top of said first silicon oxide coating and connected to the other field effect transistors at said contact areas; a second thick insulating coating on said face covering the array and the peripheral areas over the metal strips with apertures formed in the second insulating coating over only selected ones of the memory cells; and impurity implanted regions underlying the gate and gate insulator for said selected ones of the memory cells to alter substantially the threshold of the transistors of such cells compared to the transistors of memory cells other than the selected ones.

4,390,972

REFRESHING SYSTEM FOR DYNAMIC MEMORY

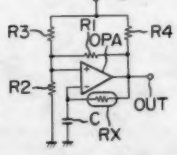
Minoru Machida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,499

Claims priority, application Japan, Nov. 29, 1979, 54/153674

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—222 2 Claims



1. An oscillator of a pulse generator for use in a system for refreshing a dynamic memory comprising:

an operational amplifier having a first input terminal and a second input terminal and an output terminal;

a thermistor connected between the first input terminal and the output terminal;

a capacitor connected between the first input terminal and a ground;

a first resistor connected between the second input terminal and the output terminal;

a second resistor connected between the second input terminal and the ground;

a third resistor connected between the second input terminal and a power supply; and

a fourth resistor connected between the output terminal and the power supply.

4,390,973

METHOD FOR DETERMINING THE EXTENT OF SUBSURFACE REACTION INVOLVING ACOUSTIC SIGNALS

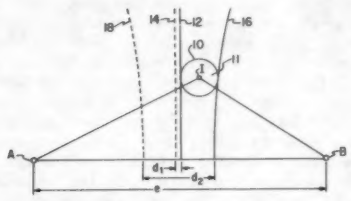
Eike Rietsch, Houston, Tex., assignor to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 21,512, Mar. 19, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,994

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812490

Int. Cl.³ G01V *1/30*

U.S. Cl. 367—40 8 Claims



1. A method for determining the extent of subsurface reactions in an earth formation in which random acoustic signals are radiated from that portion of the earth formation involved in the reaction comprising the steps of recording the acoustic signals by at least two receivers, and cross-correlating the recorded signals in accordance with one of the following equations:

$$C_{AB}(\tau) = \int s_A(t+\tau)s_B(t)dt, \text{ or } C_{AB}(\tau) = \sum_i s_A(ti+\tau)s_B(ti)$$

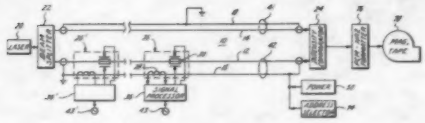
where C_{AB} is a cross-correlation function of a time shift τ, s_A corresponds to the signal received by one receiver, s_B corresponds to the signal received by the other receiver, and t is time so that at least one surface containing the reaction area is determined from the cross-correlation; and wherein two values of the time shift (τ_1, τ_2) are determined from the cross-correlation for which the values of the cross-correlation beginning with small shifts increases and, for the first time, exceeds the general noise level and, respectively, where the increased values of the cross-correlation finally return to the general noise level, and that from the absolute values of these time shifts (τ_1, τ_2) two vertex distances (d_1, d_2) are determined by multiplication of these shifts by the propagation velocity of acoustic signals, and that from these vertex distances (d_1, d_2) and the locations of the two receivers at focal points, two sheet hyperboloids of revolution are formed and the position of the reaction area is localized in such a way that, depending on the sign of the time shifts (τ_1, τ_2) the reaction area appears either inside or outside of one of the sheets of the hyperboloids of revolution.

4,390,974

SEISMIC DATA TELEMETRIC SYSTEM

Lee Siems, Houston, Tex., assignor to Litton Resources Systems, Inc., Houston, Tex.

Filed Jan. 8, 1981, Ser. No. 223,519
Int. Cl.³ G01V 1/22
U.S. Cl. 367—76 22 Claims



1. A signal transfer sensor for use with an optical fiber data handling system, comprising:

means for non-invasively coupling said sensor to said optical fiber data handling system at any desired location;

means associated with said sensor for inductively receiving power from said optical fiber data handling system;

means for accepting a signal from the optical fiber data handling system for use by the sensor;

means for sensing a data signal; and

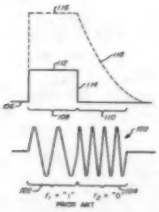
means for applying to the optical fiber data handling system, a signal related to the sensed data signal.

4,390,975

DATA TRANSMISSION IN A DRILL STRING

Elbert N. Shawhan, West Chester, Pa., assignor to NL Sperry-Sun, Inc., Sugarland, Tex.

Continuation-in-part of Ser. No. 891,657, Mar. 20, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 139,046
Int. Cl.³ G01V 1/40
U.S. Cl. 367—82 3 Claims



1. In a borehole drilling apparatus, a method of acoustically transmitting borehole data through a drill string which, due to the drill string configuration, inherently provides a resonant environment for acoustic signals transmitted therethrough, comprising the steps of:

transmitting an acoustical signal in the drill string for a first predetermined interval and ceasing transmission of the signal for a second predetermined interval, wherein the first interval is shorter than the second to ensure sufficient time to permit decay of the acoustic signal transmitted during the first predetermined interval to represent a first binary state;

ceasing transmission of said signal for a third predetermined interval to represent a second binary state; and

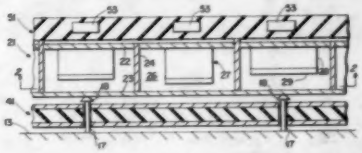
combining transmission and cessation of transmission of said signal in binary sequences representative of borehole data.

4,390,976

ACOUSTIC SIGNAL CONDITIONING DEVICE

John J. Eynck, Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1981, Ser. No. 228,847
Int. Cl.³ H04R 17/00
U.S. Cl. 367—153 6 Claims



1. An acoustic array for application to submerged hull surfaces comprises:

an acoustic baffle for attachment to the hull to reduce the transmission of shipboard noise;

an acoustic conditioning module connected to said acoustic baffle for coherently reflecting the incident acoustic signal so that the reflected acoustic signals reinforce the incident acoustic signals; said conditioning module comprises inner and outer coverplates, a plurality of spacer elements extending between said coverplates to form a plurality of closed chambers therebetween, and tuned damping elements positioned in said chambers and secured to said outer coverplate; said inner coverplate connected to said acoustic baffle; and said damping elements include an elastomeric damping layer secured to said outer coverplate and an inertial mass secured to said elastomeric damping layer and spaced from said inner coverplate; and

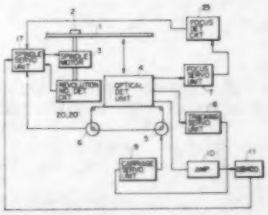
an outer layer connected to said outer coverplate and containing a plurality of hydrophone elements embedded therein, said outer layer formed of a material having an impedance which substantially matches the impedance of seawater.

4,390,977

APPARATUS FOR MAINTAINING ROTATIONAL SPEED IN DISK REPRODUCING DEVICE

Yoshio Onigata; Tsutomu Fukui, and Kazuo Yajika, all of Tokorozawa, Japan, assignors to Universal Pioneer Corporation, Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,016
Claims priority, application Japan, Nov. 17, 1980, 55-165062[U]
Int. Cl.³ G11B 27/22, 7/00
U.S. Cl. 369—50 11 Claims



1. A disc reading device in which data recorded on a disc is reproduced by a signal reading unit to provide a reproduction signal, a synchronizing signal is extracted from said reproduction signal, said synchronizing signal and a first reference signal are compared in a first comparison means to provide a first error signal and a rotating means rotates said disc at a

speed in accordance with a speed control signal, the improvement comprising:

detecting means for detecting the rotating speed of said disc independently of said synchronizing signals;

generating means for generating a second reference signal corresponding to a desired disc rotating speed;

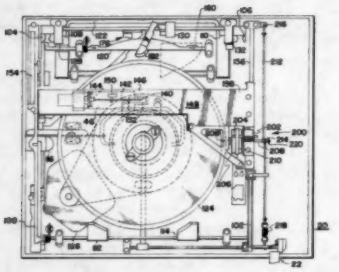
second comparison means for producing a second error signal in accordance with the difference between said second reference signal and the output of said detecting means; and

switching means for selectively applying either of said first and second error signals to said rotating means as said speed control signal.

4,390,978
CARRIAGE TRANSLATING MECHANISM FOR VIDEO DISC PLAYER

Jeremy D. Pollack, Kingston, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,183
Int. Cl.³ G11B *21/08, 3/36*
U.S. Cl. 369—220 **5 Claims**



1. In a disc record player for playing back prerecorded information from a rotatable disc record by means of a signal pickup housed in a carriage, when pickup/record relative motion is established; said carriage being subject to translation radially of said disc record during playback; a carriage drive apparatus comprising:

(A) a selectively-energized carriage drive motor mounted to said carriage, and coupled to an output shaft;

(B) a cord having a portion wrapped around said output shaft, and having its ends stretched between a pair of anchor points in said player such that said cord extends along a path substantially parallel to the direction of translation of said carriage; said drive motor causing said carriage translation when energized; and

(C) selectively-operated means for slackening said cord to reduce the tension therein to allow motion of said carriage substantially independent of said motor.

4,390,979
ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A ROTARY RECORDING MEDIUM CLAMPING DEVICE

Takashi Saito, Ayase, and Toru Kishi, Zama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

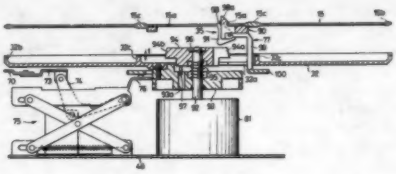
Filed Aug. 13, 1981, Ser. No. 292,396
Claims priority, application Japan, Aug. 14, 1980, 55/114488[U]
Int. Cl.³ G11B *19/00, 11/00, 17/00;* H04N *5/76*
U.S. Cl. 369—270 **10 Claims**

1. A rotary recording medium reproducing apparatus comprising a turntable onto which a rotary recording medium is placed, a motor for rotating said turntable, a reproducing transducer for reproducing a recorded signal from the rotary recording medium placed onto said turntable, and a clamping mechanism for clamping said rotary recording medium on said turntable, said clamping device comprising:

a support structure capable of unitarily rotating with said turntable and moving up and down independently of said turntable, for supporting said rotary recording medium in the vicinity of a center hole of the rotary recording medium when said support structure is in a raised position;

an elevating mechanism for moving said support structure upwards and downwards;

clamping fingers provided on said support structure for clamping said rotary recording medium on said turntable in the vicinity of the center hole of said rotary recording medium when said clamping fingers are operated, said clamping fingers being pivotally supported at positions



deviated from their centers of gravity so as to rotate towards a clamping releasing direction; and

a receiving and stopping member for rotating said clamping fingers towards a clamping direction opposite to the clamping releasing direction by receiving and stopping parts of said clamping fingers when said support structure is lowered,

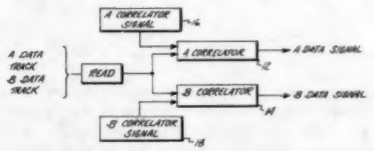
said support structure being separated from both said elevating mechanism and said receiving and stopping member when said support structure is lowered,

said clamping fingers being applied with a rotational force in the clamping direction due to the weight of said support structure, to press the part of the rotary recording medium in the vicinity of the center hole thereof against said turntable.

4,390,980
DEMULTIPLEXING PLURAL DATA STREAMS

Charles A. Brown, Chelmsford, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jul. 27, 1981, Ser. No. 287,450
Int. Cl.³ H04J *11/00, 15/00*
U.S. Cl. 370—19 **18 Claims**



1. A method of demultiplexing a composite signal containing a plurality of data streams, each stream being coded in a polarized code and phase shifted from the other streams by a predetermined phase shift, said method comprising:

providing a correlator signal for each of said plurality of data streams, each of said correlator signals being mutually orthogonal with the other correlator signals and phase shifted from the other correlator signals by the predetermined phase shift of its corresponding data stream; and

separately multiplying said composite signal by each of said

correlator signals to derive a plurality of resultant signals, each representing the data bits in a respective one of said streams.

4,390,981

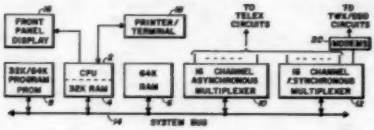
MICROPROCESSOR CONTROLLED MESSAGE HANDLING SYSTEM

Leonard J. Wood, San Mateo; Balakrishna Parasuraman; Edwin H. Williams, both of Sunnyvale; Mark G. Alexander, Mountain View, and Richard C. Montgomery, Jr., Santa Clara, all of Calif., assignors to Syscon, Inc., Sunnyvale, Calif.

Filed Dec. 29, 1980, Ser. No. 220,375

Int. Cl.³ H04J 3/04

U.S. Cl. 370—56 **22 Claims**



1. A microprocessor controlled message handling system for use in a dial-up environment and for transmitting messages to and receiving messages from existing telex, TWX and DDD terminals, comprising:

a system bus;

first memory means coupled to said bus for storing system operating programs;

second memory means coupled to said bus for storing said messages;

multichannel multiplexing means coupled between said bus and said telex terminals, said multichannel multiplexing means including a first plurality of low-speed input ports and a second plurality of high speed output ports;

modulator-demodulator means coupled between said multiplexing means and said TWX and DDD terminals; and

microprocessor means for providing on said bus write memory and read memory command signals and a signal representation of a memory location of said memory and multiplexing means connected to said bus to cause said memory location to respectively store a signal on data lines of said bus and to cause said memory location to provide a signal on said data lines.

4,390,982

DIGITAL PBX SYSTEM

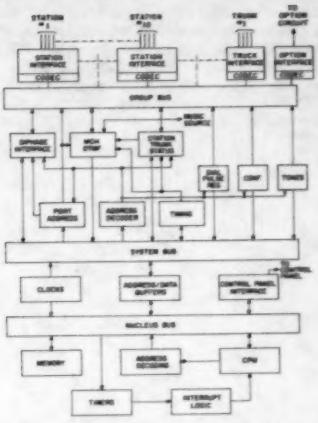
William H. Williams, Arlington, Tex., and Michael G. Burke, Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 14, 1981, Ser. No. 225,020

Int. Cl.³ H04J 3/00, 6/00

U.S. Cl. 370—67 **6 Claims**

1. A telecommunications system for providing communication between a plurality of ports having analog input and output capability over a plural channel multiple bus digital switching and control network, interface means for each port for bidirectionally coupling the port to channels of the digital network, each said interface including a coder-decoder for converting information in analog from its port for the digital network and converting information in digital form from the network to analog, each interface means comprising channel selection and storage apparatus for maintaining correspondence between channels for the transfer of information to and from its port, said channel selection and storage apparatus including means for selecting a bus of said multiple bus network for the receipt of information by said coder-decoder and



for direct transfer of information from each port to a predetermined one of said busses.

4,390,983

DIGITAL FREQUENCY SENDER

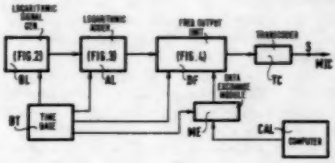
Philippe Duplessis, Colombes, and Philippe Delpit, Paris, both of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed Feb. 19, 1981, Ser. No. 235,818

Claims priority, application France, Feb. 19, 1980, 80 03572

Int. Cl.³ H03K 13/18; H04J 3/12

U.S. Cl. 370—77 **6 Claims**

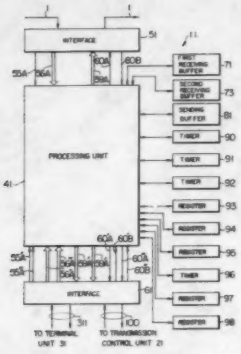


1. A digital frequency sender comprising a generator for producing as a multi-frequency code signal two single-frequency signals, said generator comprising a first memory, amplifier means, and a time base, said generator producing said multi-frequency code signal by cyclically reading out values from said first memory under the control of said time base, said values representing a sine function in compressed form, and said amplifier means amplifying the compressed signals; an adder for combining said two single-frequency signals produced by said generator to produce a compressed two-frequency signal; a frequency output unit comprising a second memory for storing the compressed two-frequency signal produced by said adder; sender means for sending the said two-frequency signals to a digital PCM channel; a data exchange module; and selector means controlled by a computer via said data exchange module for applying the contents of any word in said second memory to any time slot of the digital PCM channel.

4,390,984
STATUS CHECK METHOD FOR A DATA TRANSMISSION SYSTEM

Kazumasa Sogiura, Katsuta; Kinji Mori, Kawasaki; Hirokazu Ihara, Machida, and Yoshinori Kawai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,622
Claims priority, application Japan, Sep. 12, 1980, 55-125965
Int. Cl.³ H04J *3/08*
U.S. Cl. 370—88 **10 Claims**



1. A status check method for a data transmission system, said system comprising a first major loop formed by connecting a plurality of first transmission control units for the control of message transmission with a first loop transmission line for sending the message in a first direction; a second major loop formed by connecting a plurality of second transmission control units for the control of message transmission with a second loop transmission line for transmitting the message in a second direction opposite to said first direction, said first transmission control units being in a paired relation with said second transmission control units; a bypass transmission line capable of bidirectional message transmission and connecting said first and second transmission control units; and

a plurality of terminal units provided for each pair of said first and second transmission control units and connected to at least one of said first and second transmission control units to perform sending and selective receiving of a message to and from said first and second major loop;

said first and second transmission control units having a first register means for storing a bypass flag which is referred to for deciding as to whether the message should be given to said bypass transmission line or to said loop transmission line, and a second register means for storing its own address which should be compared with an address field contained in said received message indicating a transmission source, thereby to decide as to whether the received message is a self-generated message; said method being characterized by the following steps:

a first step where one of said first and second transmission control units sends, to the loop transmission line, a check message which contains a data field with an initial value set and a code field indicating a function of checking the state of the minor loop (which connects two adjacent pairs of transmission control units, the one pair containing its own transmission control unit while the other pair contains those on the downstream side), and starts a time counting operation to know the time-over of return time of said check message;

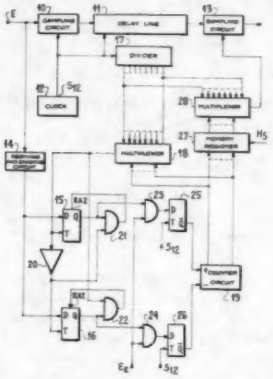
a second step where three transmission control units on said minor loop except the transmission control unit that has sent out said check message rewrite the values of data fields in the received check messages in accordance with a prescribed rule and thereafter transfer the message to adjacent transmission control units on said minor loop; and

a third step where said first or second transmission control unit that has sent out said check message decides as to whether the value of the data field in the received message is equal to a prescribed value, and if equality is confirmed, the above-mentioned time counting operation is interrupted while, if a time-over is detected, a bypass flag is set for instructing said first register means to supply subsequent message outputs to said bypass transmission line.

4,390,985
DEVICE FOR THE SYNCHRONIZATION OF DIGITAL DATA TRANSMITTED IN PACKETS

Pierre Fourcade, and Dominique Dupray, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 26, 1981, Ser. No. 247,926
Claims priority, application France, Mar. 28, 1980, 80 07015
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—94 **5 Claims**



1. A device for the synchronization of digital data transmitted in the form of packets, comprising a synchronization circuit whose input is connected to the digital signal input and which, by comparing the transitions of the digital signal and those of reference signals, defines a synchronized reference signal available after a time T_S, a delay line whose time lag is equal to T_S connected to the digital signal input and an output sampling circuit connected to the output of the delay line and comprising a sampling control input, wherein the device also comprises a memory circuit having an input coupled to the output of the synchronization circuit, a clock input for receiving a synchronization clock signal at the rhythm of the data packets, but displaced by T_S with respect to the start of said packets and an output coupled to the sampling control input of the output circuit, the content of the memory circuit being directly connected to the synchronized reference signal, the clock signal controlling the change of state of the memory circuit at a time T_S after the start of the received data packets and blocking the state of this circuit at the end of the received data packets.

4,390,986
DIGITAL SUBSCRIBER COMMUNICATION SYSTEM

Donald W. Moses, Minneapolis, Minn., assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed Apr. 21, 1980, Ser. No. 142,137
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—99 **41 Claims**

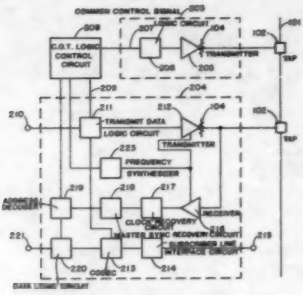
1. A digital subscriber communications system having means for transmitting and receiving a plurality of time-division mul-

tiplexed signals, each signal having a series of frames and a predetermined number of binary digits per frame, between a central office location and multiple subscriber locations characterized in that:

the means for transmitting the signals comprises;

means for generating a separate master synchronization signal for each signal transmitted;

means connected to the synchronization signal generating means for encoding each of the signals for transmission with an optimum frame format and optimum bit format within each frame wherein each frame comprises fifteen information bits per frame and one framing bit per frame



thereby creating a frame format having sixteen bits per frame; and

transmitter means for transmitting each signal in the sixteen bit frame format; and

the means for receiving the signals comprises:

means for detecting the framing bit in each frame;

means connected to the framing bit detecting means for recovering the master synchronization signal; and

means for decoding the information in each frame according to the frame format and bit format in each frame established by the framing bit and the master synchronization signal.

4,390,987

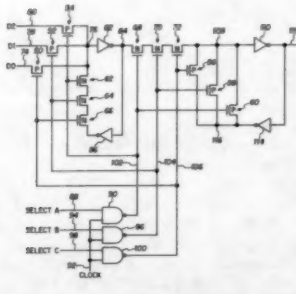
MULTIPLE INPUT MASTER/SLAVE FLIP FLOP APPARATUS

David W. Best, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,265

Int. Cl.³ H04J 3/02; H03K 17/00

U.S. Cl. 370—112 **8 Claims**



5. The method of multiplexing one of a plurality of signals through a master/slave flip flop including gating means in the input sections and feedback sections of each of the master and slave stages comprising the steps of:

parallel gating each of n signals to be multiplexed at the input section of the master stage and the feedback section of the slave stage; and

serial gating each of n signals to be multiplexed in the input section of the slave stage and in the feedback section of said master stage.

4,390,988

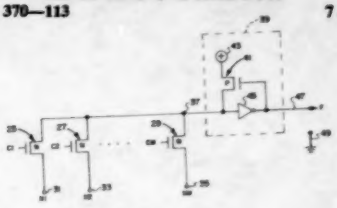
EFFICIENT MEANS FOR IMPLEMENTING MANY-TO-ONE MULTIPLEXING LOGIC IN CMOS/SOS

David W. Best, Marion, and Jeffrey D. Russell, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,264

Int. Cl.³ H04J 3/02; H03K 17/00

U.S. Cl. 370—113 **7 Claims**



5. Apparatus for reducing current consumption in a multiplexing circuit comprising, in combination:

power supply means;

signal input means for supplying signals of first and second logic values from a signal selection circuit; and

gating means connected between said power supply means and said signal input means for connecting said signal input means to said power supply means when signals are received of a first logic value approaching the voltage level of the power supply means thereby minimizing active current flow and for disconnecting said signal input means from effective electrical connection with said power supply means when the signals received are of a second logic value thereby minimizing static current flow.

4,390,989

METHOD AND AN ARRANGEMENT FOR SUPERVISING FAULTS WHEN TRANSMITTING DATA BETWEEN COMPUTERS

Jens E. Pehrson, Stocksund, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE80/00140, § 371 Date Jan. 15, 1981, § 102(e) Date Jan. 7, 1981, PCT Pub. No. WO80/02611, PCT Pub. Date Nov. 27, 1980

PCT Filed May 14, 1980, Ser. No. 229,595

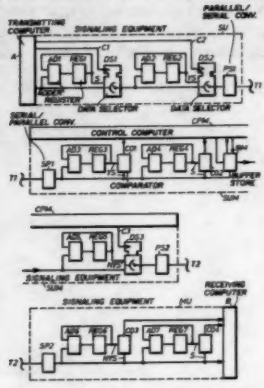
Claims priority, application Sweden, May 15, 1979, 7904270

Int. Cl.³ G06F 11/10

U.S. Cl. 371—22 **6 Claims**

1. In a data transmission system having information stations interconnected by transmission lines and wherein communication is by signal packets containing start-stop information, message words and address-control signal information, said address-control signal information being controllably changeable when passing through an information station, the method of monitoring the reliability of the elements of the system comprising: at the start of transmission generating an inner check sum by adding only all the message words of the signal packet to form an inner check sum which is not intentionally changed during the entire transmission, and inserting the inner check sum into the signal packet, whenever a signal packet leaves a station entering into the signal packet an address word associated with the destination of the packet, said address word being changeable during transmission in dependence on the next information station to receive the signal packet, generat-

ing an outer check sum which is at least the sum of the address word and the inner check word, inserting the outer check sum into the signal packet; and when a signal packet is received at an information station generating a receiving station inner check sum by adding only the message words of the received signal packet, comparing the receiving station inner check sum with the inner check sum previously inserted in the signal



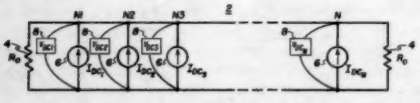
packet to determine the reliability of the upstream information station and the transmission line interconnecting the stations; and generating a receiving station outer check sum by adding all the received message words and the received inner check sum, and comparing the receiving station outer check sum with the received check sum to determine the reliability of the transmission link interconnecting the receiving information station with information check station upstream therefrom.

4,390,990

METHOD FOR MULTIPLE SIGNAL COLLISION DETECTION ON A TRANSMISSION LINE

Gerald L. Ainsworth, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 8, 1980, Ser. No. 184,855
Int. Cl.³ H04Q 9/00
U.S. Cl. 371—57 **2 Claims**



1. A method for detecting multiple signal collisions on a transmission line at a receiving node comprising the step of:

injecting a predetermined level of direct current (DC) at each active transmission node into said transmission line; and

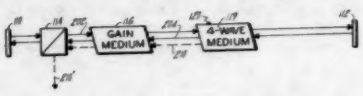
sensing at said receiving node the DC level resulting from said step of injecting a DC level at each active transmission node to indicate multiple signal collisions.

4,390,991

ADAPTIVE LASER OUTPUT COUPLER

James E. Pearson, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 6, 1981, Ser. No. 251,679
Int. Cl.³ H01S 3/08
U.S. Cl. 372—21 **4 Claims**



1. A laser having an optical cavity comprising a gain medium, reflective means defining an optical cavity about said gain medium for resonating optical radiation therein at a resonant power level and further comprising:

means for maintaining the polarization of a portion of said resonating optical radiation circulating within said cavity within a first polarization plane;

phase conjugate means, disposed intermediate said reflective means, for generating a phase conjugate beam having a variable power level and a second plane of polarization orthogonal to said first polarization plane, the ratio of said variable power level and said resonant power level being a function of said resonant power level; and

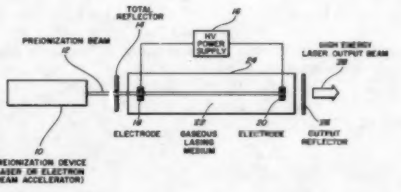
means for coupling radiation in said second plane out of said cavity.

4,390,992

PLASMA CHANNEL OPTICAL PUMPING DEVICE AND METHOD

O'Dean P. Judd, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 17, 1981, Ser. No. 284,151
Int. Cl.³ H01S 3/091
U.S. Cl. 372—70 **15 Claims**



1. An optical pumping device for a repetitively operated gaseous laser comprising:

a gaseous lasing medium;

electrodes disposed in said gaseous lasing medium;

means for providing an electrical potential between said electrodes;

laser means for generating a repetitive pulsed laser beam which produces a substantially uniform longitudinal preionization path in said gaseous lasing medium in the axial direction of said laser between said electrodes sufficient to cause said electrical potential to produce an electrical discharge between said electrodes to form a plasma channel along said preionizatoin path,

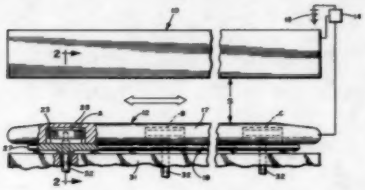
said plasma channel having sufficient blackbody radiation determined by said means for providing an electrical potential to optically pump said lasing medium in a repetitive manner.

4,390,993

LASER ELECTRODE ASSEMBLY

Richard J. Sojka, San Lorenzo; Leonard W. Braverman, San Francisco; Steve Guch, Jr., Saratoga, and David J. Clark, Atherton, all of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 18, 1981, Ser. No. 264,367
Int. Cl.³ H01S 3/097
U.S. Cl. 372—87 2 Claims



1. An electrode assembly for a laser, said laser having a base, said assembly comprising

first and second elongated coextensive electrodes spaced apart to define a discharge gap,

said first electrode comprising an elongated carrier fastened to said base and a bar adjacent to and coextensive with said carrier on the side thereof opposite from said base, said bar having one side facing said second electrode and having a plurality of longitudinally spaced and aligned sockets on the opposite side thereof,

said carrier having a like number of longitudinally spaced and aligned plugs projecting therefrom toward said second electrode adapted to be removably insertable in said sockets, respectively,

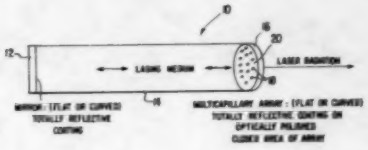
each of said plugs having spring fingers secured thereto and engageable with said bar within the associated socket for releasably connecting said bar to said carrier.

4,390,994

LASER UTILIZING COATED, MULTICAPILLARY ARRAY AS OUTPUT WINDOW

James R. Roberts, 12512 W. Old Baltimore Rd., Boyds, Md. 20720; Thomas J. McIlrath, 5944 Westchester Park Dr., College Park, Md. 20740, and Thomas B. Lacaturto, 3600 Van Ness St., NW., Washington, D.C. 20008

Filed Jul. 14, 1980, Ser. No. 168,698
Int. Cl.³ H01S 3/08
U.S. Cl. 372—99 5 Claims



1. In a laser for generating output radiation having a wavelength of less than 2000 Å, including an active, lasing medium, pumping means for creating a population inversion in said medium, and an optical resonant cavity including a totally reflective mirror disposed at one end of the resonant cavity and an output window disposed at the other end of the resonant cavity, the improvement comprising said output window including a multi-capillary array having a plate with a plurality of pores extending therethrough parallel to the said output radiation from the laser, said pores having a diameter, a length, and a diameter-to-length ratio comprising a means for establishing molecular flow of said lasing medium therethrough, said pores comprise an open area of the plate and the remaining area of said plate in contact with the lasing medium and surrounding said pores comprises a closed area, said closed area being normal to the laser radiation and provided with a coating which reflects the laser radiation.

DESIGN PATENTS

GRANTED JUN. 28, 1983

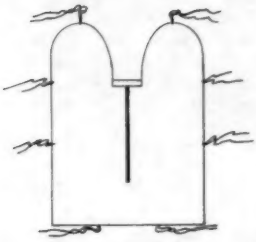
ERRATA

For CLASS	See PATENT NO.
D07–308	269,516
D07–308	269,517

DESIGNS

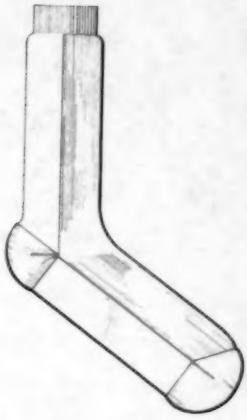
JUNE 28, 1983

269,474
INFANT SLEEPING BAG OR SIMILAR ARTICLE
Patricia R. Mundy, 1411 Wysteria Way, Richardson, Tex. 75080
Filed Mar. 27, 1981, Ser. No. 248,320
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—17



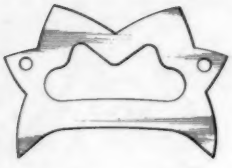
269,475
BABY BUNTING
Darlene J. Albertson, Milwaukie, Oreg., assignor to Verna Howell, Gladstone, Oreg.
Filed Feb. 9, 1981, Ser. No. 232,586
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

269,476
SOCK
Daniel L. Brier, 530 25th Ave., NW., Hickory, N.C. 28601
Filed Sep. 15, 1980, Ser. No. 187,473
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—331

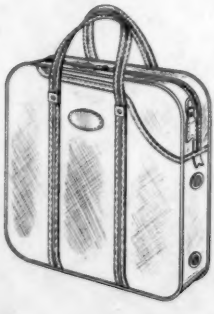


269,477
SOCK
Daniel L. Brier, 530 25th Ave., NW., Hickory, N.C. 28601
Filed Sep. 15, 1980, Ser. No. 187,475
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—331

269,478
KEY RING
John Y. Enomoto, 2035 Heather Dr., Monterey Park, Calif. 91754
Filed May 11, 1981, Ser. No. 262,344
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61

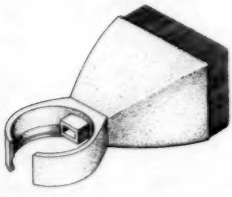


269,479
SPORT BAG
Joseph Y. Pelavin, North Bergen, N.J., assignor to CPG Products Corp., Minneapolis, Minn.
Filed Dec. 23, 1980, Ser. No. 219,468
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

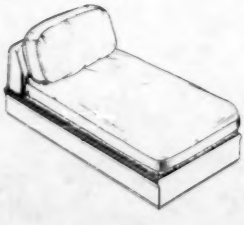


269,480
COMBINED CARRYING AND STORAGE CASE AND CONTROL DISPLAY STAND FOR ELECTRONIC MUSICAL INSTRUMENT COMPONENTS
Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464; Patrick J. Bovenizer, Alsip, Ill.; Richard W. Jensen, Elmhurst, Ill., and William H. Hass, Hickory Hills, Ill., assignors to Richard H. Peterson, Palos Park, Ill.
Filed Jun. 9, 1981, Ser. No. 271,760
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—76

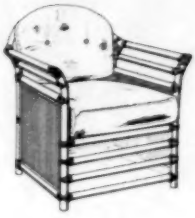
269,481
COMBINED DISPENSER AND BRUSH ATTACHMENT FOR A SHAVING CREAM CONTAINER OR THE LIKE
Edward P. Souza, 255 Union Ave., Campbell, Calif. 95008
Filed Mar. 26, 1981, Ser. No. 247,837
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—19



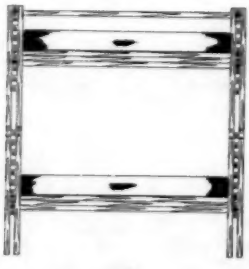
269,482
LOUNGE SEAT OR SIMILAR ARTICLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Apr. 29, 1981, Ser. No. 258,595
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

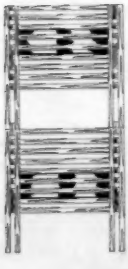


269,483
ARMCHAIR
Henry Olko, Chicken Valley Rd., Locust Valley, N.Y. 11650
Filed Oct. 23, 1980, Ser. No. 199,857
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

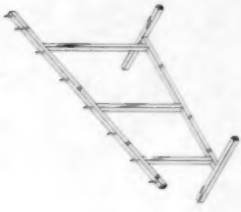


269,484
BUNK BED
Robert V. Thompson, Boatyard Condominiums, 75th Ave., N., Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,801
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83





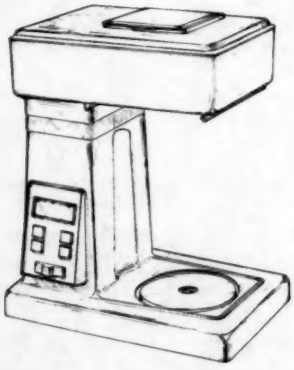
269,485
SUPPORT FOR SPOOLS OF ELECTRICAL WIRES OR THE LIKE
Jack C. Beall, 9440 S. Central Expressway, Dallas, Tex. 75216
Filed Feb. 9, 1981, Ser. No. 232,885
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85



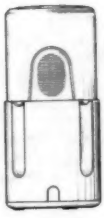
269,486
HAT HOLDER
Sam R. Marrs, 9924 Miller, Apt. 128, Dallas, Tex. 75218
Filed Oct. 30, 1980, Ser. No. 202,148
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—116

269,487
LABORATORY TABLE OR SIMILAR ARTICLE
Klaus Maier, Heidenheim, Fed. Rep. of Germany, assignor to Strohm + Maier Labormöbel GmbH, Heidenheim, Fed. Rep. of Germany
Filed Apr. 7, 1980, Ser. No. 138,374
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2131/79
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

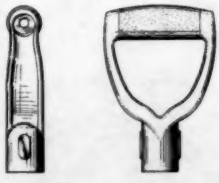
269,488
COFFEE BREWER
Vincent G. Marotta, 18801 S. Park Blvd., Shaker Heights, Ohio 44122
Filed Jul. 1, 1981, Ser. No. 279,533
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—309



269,489
TABLE TOP MILL
Tsugio Akita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 1, 1981, Ser. No. 268,618
Claims priority, application Japan, Dec. 19, 1980, 55-53241
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—53



269,490
HANDLE FOR HAND TOOLS
Robert A. Germain, Ashtabula, Ohio, assignor to True Temper Corporation, Cleveland, Ohio
Filed Jan. 30, 1981, Ser. No. 229,974
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—1



269,491
GARDEN SHEARS

Alan K. Pittaway, High Wycombe, England, assignor to Wilkinson Sword, Limited, England

Filed Jul. 28, 1981, Ser. No. 287,660
Claims priority, application United Kingdom, Jan. 31, 1981, 81998682; Jan. 31, 1981, 81998683
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—5

269,492
BEVERAGE CAN CRUSHER

Albert L. Peggs, 1824 Calle Ciervos, San Dimas, Calif. 91773

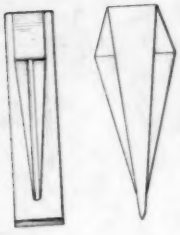
Filed May 4, 1981, Ser. No. 260,379
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

269,493
SOLDERING IRON HANDLE

Daniel C. Koturov, Stanton, and Alvis R. Knowles, Carson, both of Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.

Filed Jan. 22, 1981, Ser. No. 227,430
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

269,494
WEDGE
Anthony M. Tremaglio, 184 Maybrook Rd., Waterbury, Conn. 06708, and Philip Kaye, 35 Turkey Hill N., Westport, Conn. 06880
Filed Feb. 19, 1981, Ser. No. 234,980
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—47



269,495
WEDGE
Arnold H. Finn, Farmington, Conn., assignor to TACO Products, Incorporated, Plainville, Conn.
Filed Jul. 27, 1981, Ser. No. 287,508
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—47

269,496
COMPOUND HAND TOOL
Maynard H. Brown, Jr., 308 East St., East Herkimer, N.Y. 13350
Filed May 15, 1981, Ser. No. 264,201
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—81

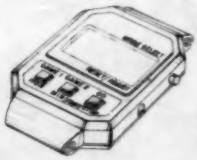
269,497
BRAKE SPRING TOOL
Frank Rogowsky, 3651 Brandon Gate Dr., Mississauga, Ontario, Canada (L4T 3E4)
Filed May 6, 1981, Ser. No. 261,264
Claims priority, application Canada, Nov. 19, 1980, 19-11-80-1
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

269,498
FLASK OR SIMILAR ARTICLE
Frank H. Witt, Jr., Trumbull, Conn., assignor to Rosalie S. Levine, Trumbull; Mildred J. Bisacca, Fairfield and GRRN Co., Easton, all of, Conn., part interest to each
Filed Oct. 15, 1980, Ser. No. 197,335
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—307

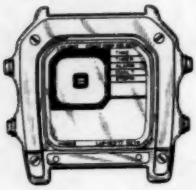
269,499
BOTTLE
Francisco Rafart, Barcelona, Spain, assignor to L'Aixertell, S.A., Barcelona, Spain
Filed Oct. 26, 1979, Ser. No. 88,642
Claims priority, application Spain, Apr. 27, 1979, 94534
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

269,500
BOTTLE
Claude Bit, Thonon, France, assignor to Societe Anonyme des Eaux Minerales d'Evian, Evian des Bains, France
Filed Feb. 27, 1981, Ser. No. 239,655
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—350

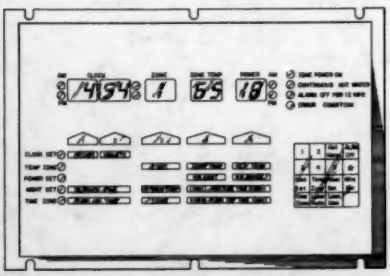
269,501
ELECTRONIC WRIST WATCH GAME
Katsumi Sato, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 15, 1981, Ser. No. 264,542
Claims priority, application Japan, Nov. 8, 1980, 55-46822
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—31



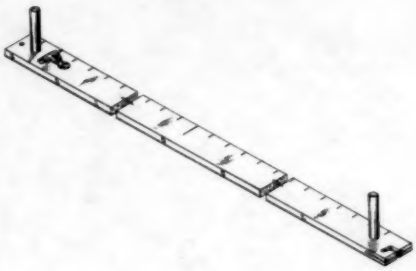
269,502
DIGITAL WRISTWATCH
Masaharu Tanaka, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 20, 1981, Ser. No. 255,420
Claims priority, application Japan, Oct. 27, 1980, 55-44816
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



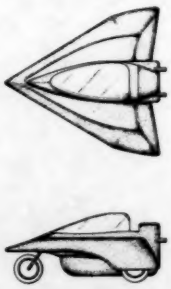
269,503
FACE PLATE FOR A DEMAND LIMITER
Stanley S. Huffman, Golden; Alan F. Neel, II, Lakewood, and Rodney M. Johnson, Golden, all of Colo., assignors to Peak Demand Limiters, Inc., Lakewood, Colo.
Filed Dec. 26, 1979, Ser. No. 107,407
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



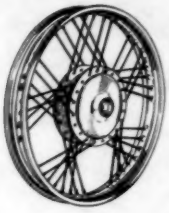
269,504
MACRAME MEASURE
Suzie Swenson, 29 Red Deer Rd., Londonderry, N.H. 03053
Filed Mar. 12, 1981, Ser. No. 243,059
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



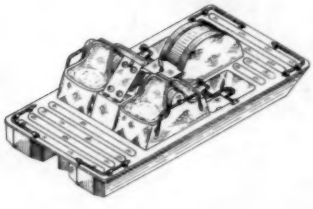
269,505
TRANSPORTATION VEHICLE
Gilbert L. Gordon, 3513 Clark Rd., Indianapolis, Ind. 46224
Filed Jan. 19, 1981, Ser. No. 226,049
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85



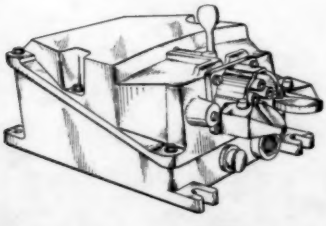
269,506
WHEEL FOR MOTORCYCLE
Toshiyuki Suzuki, Shimada; Kazumi Inaba, Toyookamura, and Kiyoshi Amaki, Kaga, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Nov. 10, 1980, Ser. No. 205,704
Claims priority, application Japan, May 13, 1980, 55/18665
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



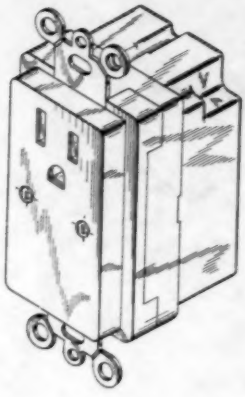
269,507
PADDLE BOAT
Paul K. Sabelhouse, Jr., Wolcottville, and Paul K. Sabelhouse, Sr., Rome City, both of Ind., assignors to Ayr-Way Industries, Inc., Kendallville, Ind.
Filed Dec. 18, 1980, Ser. No. 217,799
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—306



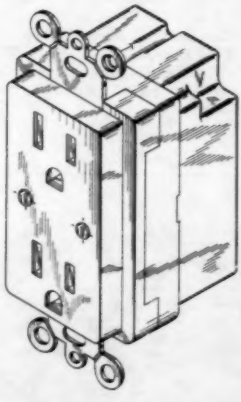
269,508
ELECTRICAL CONNECTOR
Bronius Guizauskas, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.
Filed Dec. 20, 1979, Ser. No. 105,834
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



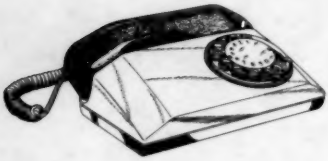
269,509
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,309
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



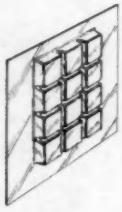
269,510
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,317
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30



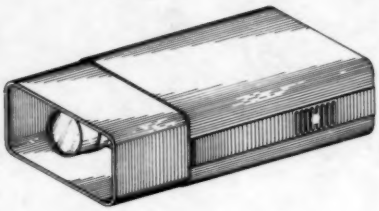
269,511
DESK TELEPHONE
Giovanni Arduini, and Marco del Corno, both of Milan, Italy, assignors to Italtel S.p.A., Milan, Italy
Filed Oct. 21, 1980, Ser. No. 199,320
Claims priority, application Italy, Apr. 24, 1980, 21638 B/80
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



269,512
NUMBER ENLARGER COVER FOR A PUSH-BUTTON TELEPHONE
Norton R. Goldberg, Skokie, Ill., assignor to Hodin Marketing, Inc., Chicago, Ill.
Filed Aug. 20, 1982, Ser. No. 409,908
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

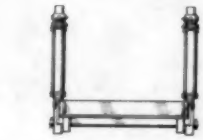


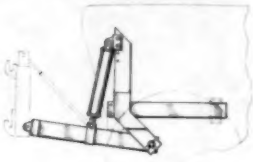
269,513
TELEVISION CAMERA OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to VCS, Inc., Carol Stream, Ill.
Filed Aug. 21, 1980, Ser. No. 180,077
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—78



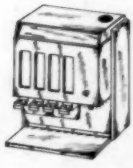
269,514
SNOW THROWER
John M. Berner, 4927 St. Croix Ave., Minneapolis, Minn. 55422
Filed Mar. 27, 1979, Ser. No. 24,308
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D15—12

269,515
QUICK COUPLER MOUNT FOR FRONT OF FARM TRACTOR
Andrew C. Yoder, R.R. #1, Amboy, Ind. 46911
Filed Feb. 6, 1981, Ser. No. 232,230
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—32





269,516
BEVERAGE DISPENSER
John G. Kiser, Albert Lea, Minn., assignor to Fountain Industries, Inc., Albert Lea, Minn.
Filed May 11, 1981, Ser. No. 262,558
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—308

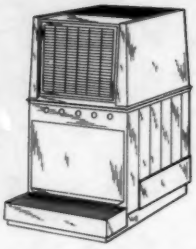


269,517

BEVERAGE DISPENSER

James D. Vogel, Anoka, and William B. MacKrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Mar. 23, 1981, Ser. No. 246,563
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—308

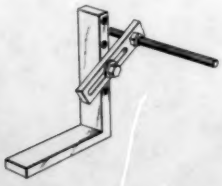


269,518

MILLING MACHINE TABLE STOP OR SIMILAR ARTICLE

Paul Karlan, 511 Center Ave., Mamaroneck, N.Y. 10543

Filed Jul. 7, 1980, Ser. No. 166,309
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

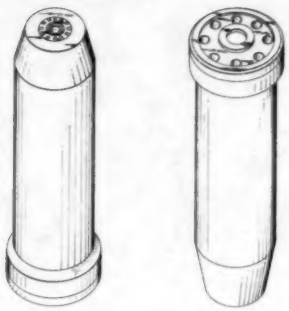


269,519

NOZZLE FOR A CUTTING TORCH

Stellan Braun, Dalby, Sweden, assignor to AGA Aktiebolag, Sweden

Filed Dec. 2, 1980, Ser. No. 212,524
Term of patent 14 years
Int. Cl. D15—*09*; D8—*03*
U.S. Cl. D15—144



269,520

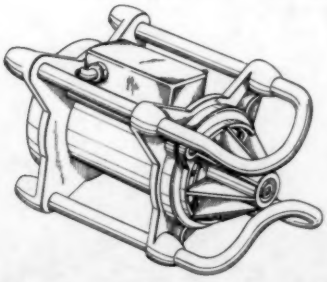
NOZZLE COMPONENT FOR A CUTTING TORCH

Stellan Braun, Dalby, Sweden, assignor to AGA Aktiebolag, Sweden

Filed Dec. 2, 1980, Ser. No. 212,525
Term of patent 14 years
Int. Cl. D15—*09*; D8—*03*
U.S. Cl. D15—144

269,521
NOZZLE COMPONENT FOR A CUTTING TORCH
Stellan Braun, Dalby, Sweden, assignor to AGA Aktiebolag, Sweden
Filed Dec. 2, 1980, Ser. No. 212,526
Term of patent 14 years
Int. Cl. D15—*09*; D8—*03*
U.S. Cl. D15—144

269,522
DRIVE UNIT FOR FLEXSHAFT VIBRATORS
Lee E. Reichel, Kettering, and David H. Voisard, Troy, both of Ohio, assignors to Koehring Company, Brookfield, Wis.
Filed Jun. 26, 1980, Ser. No. 163,335
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147



269,523
GUITAR OR SIMILAR ARTICLE
Charles T. Burge, Kalamazoo, Mich., assignor to Norlin Industries, Inc., White Plains, N.Y.
Filed Jun. 15, 1981, Ser. No. 274,326
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

269,524
BASS GUITAR OR SIMILAR ARTICLE
Charles T. Burge, Kalamazoo, Mich., assignor to Norlin Industries, Inc., White Plains, N.Y.
Filed Jun. 15, 1981, Ser. No. 274,327
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

269,525

LABELLING APPARATUS

Wolfgang Reinke, Rothenberg, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

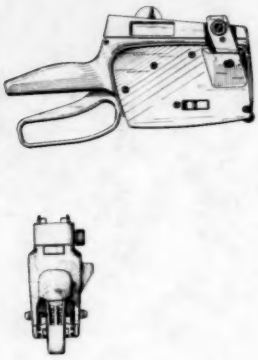
Filed Dec. 19, 1980, Ser. No. 218,408

Claims priority, application Switzerland, Jul. 14, 1980, 111295/80

Term of patent 14 years

Int. Cl. D18—99

U.S. Cl. D18—19



269,526

LABEL PRINTING AND APPLYING APPARATUS

Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

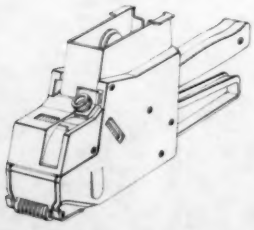
Filed Dec. 22, 1980, Ser. No. 218,723

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, URA 679/80

Term of patent 14 years

Int. Cl. D18—99

U.S. Cl. D18—19



269,527

LABELLING APPARATUS

Werner Becker, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

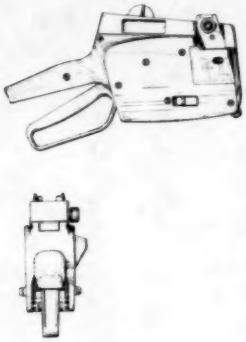
Filed Dec. 22, 1980, Ser. No. 219,343

Claims priority, application Switzerland, Jul. 14, 1980, 111294

Term of patent 14 years

Int. Cl. D18—99

U.S. Cl. D18—19



269,528

FORMS ACCUMULATOR SHELF FOR A PRINTER

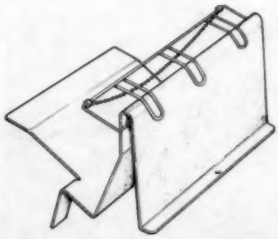
Eugene K. Sokolowski, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 2, 1981, Ser. No. 239,782

Term of patent 14 years

Int. Cl. D18—99

U.S. Cl. D18—22



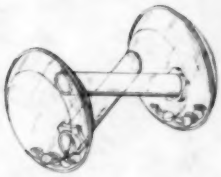
269,529
COMBINED MEMO PAPER DISPENSER, CALENDAR AND PICTURE MOUNT
Tang W. Luen, Kowloon, Hong Kong, assignor to Tang Fun Kee Manufacturing Co., Ltd., Kowloon, Hong Kong
Filed Feb. 17, 1981, Ser. No. 234,497
Claims priority, application United Kingdom, Aug. 19, 1980, 996203
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—22

269,530
WRITING INSTRUMENT OR SIMILAR ARTICLE
Richard Luntz, P.O. Box 24234, Lyndhurst, Ohio 44924
Filed Jul. 17, 1981, Ser. No. 284,520
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

269,531
CONTAINER FOR LIQUID ADHESIVE
Tsuneo Ando, Fujisawa, Japan, assignor to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan
Filed Nov. 25, 1980, Ser. No. 210,262
Claims priority, application Japan, May 22, 1980, 55-019856
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—66

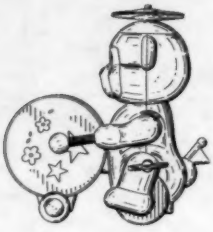
269,532
COMBINED CLOCK AND ADVERTISING DISPLAY DEVICE
Carlos P. Amar, 600 NE. 36 St., Miami, Fla. 33137
Filed Nov. 24, 1980, Ser. No. 209,407
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—20

269,533
ROLLING TOY
Richard A. Chase; Danny E. Simpson, both of Baltimore, Md., and D. Michael Williams, New York, N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Oct. 30, 1980, Ser. No. 202,388
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64



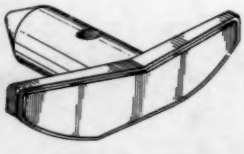
269,534
ACTION TOY
Geoffrey C. Garth, Long Beach, Calif., assignor to Tomy Corporation, Carson, Calif.
Filed Oct. 20, 1980, Ser. No. 198,803
Claims priority, application Japan, Aug. 27, 1979, 54-35693
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

269,535
TOY MONKEY
Wai-Kuen Tung, Kowloon, Hong Kong, assignor to The Best Toys Co. Ltd., Kowloon, Hong Kong
Filed Feb. 2, 1981, Ser. No. 230,374
Claims priority, application United Kingdom, Oct. 29, 1980, 997304
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



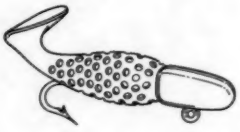
269,536
BALL CATCHING AND THROWING DEVICE
Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jun. 10, 1980, Ser. No. 158,330
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—210

269,537
GOLF PUTTER HEAD
Richard B. C. Tucker, Baltimore, Md., assignor to STX, Inc., Baltimore, Md.
Filed Jan. 23, 1981, Ser. No. 227,804
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219

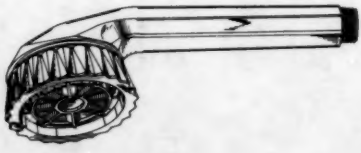


269,538
PLAYGROUND SEE-SAW
Roland H. Sinfield, 96 S. 360 West, and A. Neil Grose, 111 E. 100 South, both of Morgan, Utah 84050
Filed Mar. 10, 1981, Ser. No. 242,198
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—251

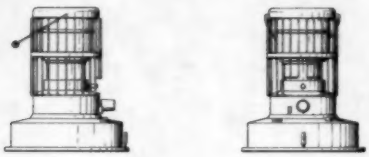
269,539
ARTIFICIAL FISHING LURE
William O. Williams, Jr., Rte. 2, Box 172, Clover, S.C. 29201
Division of Ser. No. 103,482, Dec. 14, 1979, Pat. No. 263,988.
This application Nov. 16, 1981, Ser. No. 321,683
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



269,540
HAND SHOWER
Nils Larsson, Dalavägen 50, Västra Frölunda, Sweden (421 68)
Filed Feb. 26, 1981, Ser. No. 238,439
Claims priority, application Sweden, Aug. 26, 1980, 80-1593
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

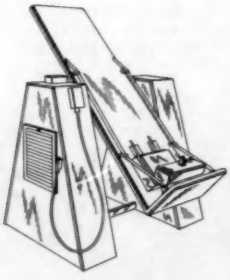


269,541
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Dec. 5, 1980, Ser. No. 213,756
Claims priority, application Japan, Jun. 5, 1980, 55-22450
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123



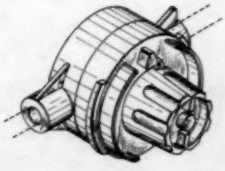
269,542
WOOD STOVE TOP
Anthony A. Mote, 9808 Polk East, Tacoma, Wash. 98445
Filed Dec. 2, 1980, Ser. No. 212,231
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

269,543
TRACTION TABLE
Robert R. Walper, and Frederick R. Wilkes, both of Sarasota, Fla., assignors to Walper Corporation, Sarasota, Fla.
Filed Jan. 23, 1981, Ser. No. 227,613
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—03



269,544
COAL ANALYZER OR THE LIKE
Solomon Jarmell, Pittsburgh, and Barry E. Rodgers, Eastmont, both of Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Filed Jun. 2, 1980, Ser. No. 155,850
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D24—8

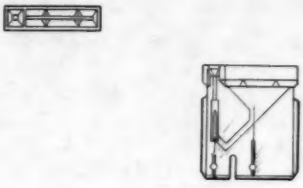
269,545
DISPOSABLE CASSETTE FOR USE WITH AN INTRAVENOUS CONTROLLER
Raymond E. Cannon, San Diego, Calif., assignor to IMED Corporation, San Diego, Calif.
Filed Jan. 27, 1981, Ser. No. 228,887
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8



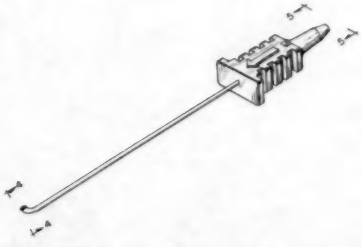
269,546
PHYSIOLOGIC MONITOR OR THE LIKE
Robert K. Rogers; Robert R. Steuer, both of Salt Lake City, Utah; F. Gordon Mackay, Tarzana, and Spencer L. Mackay, Canoga Park, both of Calif., assignors to DNA Medical, Inc., Salt Lake City, Utah
Filed Oct. 16, 1980, Ser. No. 197,764
Term of patent 14 years
Int. Cl. D24—*02;* D10—*02*
U.S. Cl. D24—17

269,547
TIBIAL COMPONENT EXTENDER AND TOOL FOR IMPLANTATION
David B. Rosenthal, 150-15 86th Ave., Jamaica, N.Y. 11432
Filed Jul. 16, 1981, Ser. No. 284,075
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

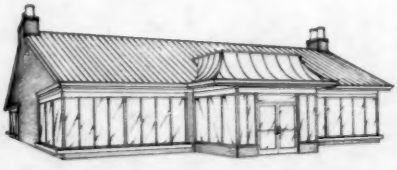
269,548
CARTRIDGE FOR DETERMINING THE ELECTROCHEMICAL CHARACTERISTICS OF A LIQUID
Robert J. Sarrine, Ann Arbor, and Steven E. Enzer, Brooklyn, both of Mich., assignors to Transidyne General Corp., Ann Arbor, Mich.
Filed Dec. 15, 1980, Ser. No. 216,462
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—19



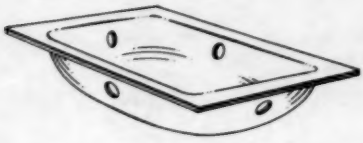
269,549
EPIDURAL NEEDLE
James R. Gross, Bartlett, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Oct. 9, 1980, Ser. No. 195,449
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54



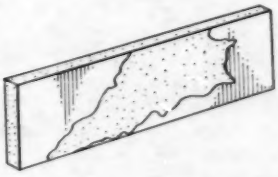
269,550
BUILDING
Thomas L. Tollett, Memphis, Tenn., assignor to Dobbs House, Inc.
Filed Jun. 22, 1981, Ser. No. 275,673
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



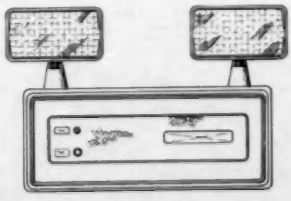
269,551
CEILING TILE
Ghislain Riverin, R.R. #2, Hamilton, Ontario, Canada (L8N 2Z7)
Filed Jul. 17, 1979, Ser. No. 58,354
Claims priority, application Canada, Jun. 25, 1979, 25-06-79-1
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



269,552
BRICK
Elsie M. Atkinson, Huntington Beach, Calif., assignor to Atkinson Brick Co., Los Angeles, Calif.
Filed Sep. 30, 1980, Ser. No. 192,608
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—86

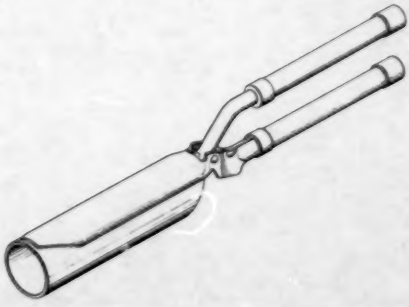


269,553
EMERGENCY LIGHTING UNIT
Robert W. Johnson, Bucks County, Pa., and Donald W. Doman, Rock County, Wis., assignors to Exide Electronics Corporation, Philadelphia, Pa.
Filed Aug. 14, 1980, Ser. No. 178,034
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—63



269,554
LIGHTER
Taro Yanai, No. 3-13, Shirakawa 1-chome, Koto-ku, Tokyo, Japan
Filed Jun. 27, 1980, Ser. No. 163,913
Claims priority, application Japan, Dec. 28, 1979, 54-182674[U]
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

269,555
HAIR CURLING IRON OR THE LIKE
Clifford J. Peterson, 1021 N. Crescent Dr., #301, Hollywood, Calif. 90046; Peter Dawes, 5031 Genesta, Encino, Calif. 91316, and Gary E. Birks, 615 Avenue "D", Redondo Beach, Calif. 90277
Filed Nov. 9, 1981, Ser. No. 319,681
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

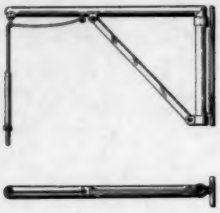


269,556

HORSE TETHERING SUPPORT

James Studley, 1501 Hillside Ave., Norco, Calif. 91760, and Bennie J. Johnson, 14039 Santa Ana Ave., Fontana, Calif. 92335

Filed Jan. 12, 1981, Ser. No. 224,277
Term of patent 14 years
Int. Cl. D30—*09*
U.S. Cl. D30—44



269,557

FLOOR POLISHER

Floyd L. Cook, Jr., Muskegon Heights, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

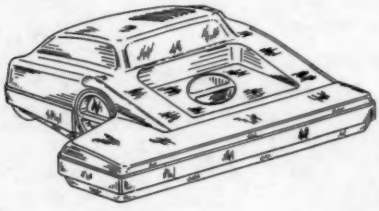
Filed Mar. 24, 1980, Ser. No. 133,447
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—19

269,558

CLEANER MAIN BODY OR THE LIKE

John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Nov. 6, 1980, Ser. No. 204,467
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—22



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JUNE, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Gibson, Paul W.; and Orthoefer, Frank T., 4,390,450, Cl. 252-307.000.

Abe, Seiko: *See*—
Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, 4,390,000, Cl. 123-549.000.

Aberer, James B.: *See*—
Ostroski, Richard J.; Aberer, James B.; and Best, Gary, 4,389,780, Cl. 30-408.000.

Abraham, Fayez F., to Tyler Refrigeration Corporation. One and a half band refrigerated display case. 4,389,852, Cl. 62-82.000.

ABU Aktiebolag: *See*—
Karlsson, Jarding U.; and Moosberg, Borje S., 4,390,140, Cl. 242-84.52C.

Acker, Otto H. Bicycle construction. 4,390,191, Cl. 280-281.00R.

Ackerman, William R., to W. R. Weaver Co. Range-finding telescopic sight. 4,389,791, Cl. 33-246.000.

Ackermann, Robert A.; and Vitale, Nicholas G., to Mechanical Technology Incorporated. Two stage stirling engine. 4,389,844, Cl. 60-517.000.

Acquaye, Clemenceau T. A.: *See*—
Gorecki, Marian; Acquaye, Clemenceau T. A.; Wilchek, Meir; and Rich, Alexander, 4,390,526, Cl. 424-177.000.

Adachi, Keiichi: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, 4,390,618, Cl. 430-543.000.

Adamek, David J.: *See*—
McLaren, Edwin C.; and Adamek, David J., 4,389,802, Cl. 40-307.000.

Addadi, Lia: *See*—
Lahav, Meir; Addadi, Lia; and Weissbuch, Isabela, 4,390,722, Cl. 562-402.000.

Addis, John L., to Tektronix, Inc. Buffer amplifier. 4,390,852, Cl. 330-300.000.

Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, to Kabelmetal Electro GmbH; and Diosgyori Gepgyar. Single-twist stranding. 4,389,838, Cl. 57-71.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Junter, Guy-Alain; Lemeland, Jean-Francois; Delegny, Eric; and Vingent, Jean-Claude, 4,390,620, Cl. 435-4.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Biedermann, Ernst; Findeis, Gunter; Weber, Klaus; and Zahn, Wolfgang, 4,390,270, Cl. 355-46.000.

Agrico Chemical Company: *See*—
Weston, Charles W.; and O'Neill, Padraic S., 4,390,509, Cl. 423-313.000.

Agrotechnika, narodni podnik: *See*—
Mackrle, Svatopluk; Mackrle, Vladimir; and Dracka, Vladimi 4,390,422, Cl. 210-188.000.

Agulia, Gianluigi. Remote tire pressure indicator. 4,389,884, Cl. 73-146.500.

Agurok, Peisakh Y.: *See*—
Rusinov, Mikhail M.; Judova, Galina N.; Kudryashov, Jury V.; and Agurok, Peisakh Y., 4,390,249, Cl. 350-453.000.

Aharoni, Shaul M., to Allied Corporation. Injection moldable poly-(ethylene terephthalate). 4,390,649, Cl. 524-167.000.

Aharoni, Shaul M.; and Largman, Theodore, to Allied Corporation. Process for increasing the melt viscosity of polyamide with a v phosphate compound. 4,390,667, Cl. 525-420.000.

Ainsworth, Gerald L., to Hewlett-Packard Company. Meth of multiple signal collision detection on a transmission line. 4,390,990, Cl. 371-57.000.

Aisin Seiki Company, Limited: *See*—
Toyoda, Minoru, 4,389,864, Cl. 70-456.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Nawa, Hideo, 4,389,956, Cl. 112-240.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Ornamental attachment for slide fastener sliders. 4,389,758, Cl. 24-205.11R.

Akiba, Nobuo: *See*—
Furuichi, Masayoshi; Honjo, Takeshi; and Akiba, Nobuo, 4,390,268, Cl. 355-15.000.

Aktiebolag Carl Munters: *See*—
Ernst, Gunter; and Wurz, Dieter, 4,390,481, Cl. 261-112.000.

Aktiebolaget Metka: *See*—
Hakansson, William, 4,389,778, Cl. 30-338.000.

Aktiebolaget Svenska Precisions verktyg: *See*—
Eriksson, Alf, 4,390,310, Cl. 408-141.000.

AKZO N.V.: *See*—
Havinga, Reginoldus; Torenbeek, Reinder; and Schreurs, Petrus H. M., 4,390,451, Cl. 252-311.000.
Henne, Werner; and Scheuren, Jurgen, 4,390,455, Cl. 252-430.000.
van der Werff, Oebele P., 4,389,839, Cl. 57-238.000.

Alani, Safwat D.; and Sellman, Milhim D. Application unit for epicutaneous testing or treatment. 4,390,027, Cl. 128-743.000.

Albany International Corp.: *See*—
Duncan, Jeffrey B., 4,390,433, Cl. 210-767.000.

Albert, Lionel, to Jovanita Inc. Micro-wave ovens. 4,390,965, Cl. 364-400.000.

Albertson, Robert V. Apparatus for reciprocating liquid in a cooling system of an internal combustion engine. 4,390,049, Cl. 141-92.000.

Albrechtson, Loren R.: *See*—
Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., 4,390,614, Cl. 430-252.000.

Albrile, Walter, to Ing. C. Olivetti & C., S.p.A. Carriage support for typewriter. 4,390,295, Cl. 400-330.100.

Alcon Pharmaceuticals Limited: *See*—
Feurer, Bernard, 4,390,482, Cl. 264-1.400.

Alexander, Mark G.: *See*—
Wood, Leonard J.; Parasuraman, Balakrishna; Williams, Edwin H.; Alexander, Mark G.; and Montgomery, Richard C., Jr., 4,390,981, Cl. 370-56.000.

Alexander, William J., III. Oscillating guide roll assembly for cloth winder. 4,390,139, Cl. 242-66.000.

Alfa-Laval AB: *See*—
Palm, Bengt A., 4,390,350, Cl. 55-38.000.

Alferness, Rodney C., to Bell Telephone Laboratories, Incorporated. Tunable polarization independent wavelength filter. 4,390,236, Cl. 350-96.140.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. 1-Amino-2-[3-(3-piperidinomethylphenoxy)propylamino]cyclobutene-3,4-dione. 4,390,701, Cl. 546-235.000.

Alison, John R. Turbine wheel. 4,390,316, Cl. 415-76.000.

Allen & Hanburys Limited: *See*—
Roberts, Stanley M., 4,390,721, Cl. 560-256.000.

Allen, Stephen A.: *See*—
Olsen, John D.; and Allen, Stephen A., 4,390,945, Cl. 364-200.000.

Allied Corporation: *See*—
Aharoni, Shaul M., 4,390,649, Cl. 524-167.000.
Aharoni, Shaul M.; and Largman, Theodore, 4,390,667, Cl. 525-420.000.
Kato, Kenneth J.; and Frollini, Dominick, Jr., 4,390,406, Cl. 204-435.000.
Long, Emile D.; and Richardson, Keith C., 4,389,993, Cl. 123-421.000.
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,390,402, Cl. 204-180.00P.
Marshall, Robert M.; and Dardoufas, Kimon C., 4,390,591, Cl. 428-391.000.
Segal, Leon, 4,390,489, Cl. 264-126.000.

Allingham, Robert P.: *See*—
Weeks, Paul D.; and Allingham, Robert P., 4,390,709, Cl. 549-418.000.

Allis-Chalmers Corporation: *See*—
Downing, Terry R.; Zorns, John M.; and Croft, Winfred C., 4,390,085, Cl. 188-72.900.

Alsch, Gottfried, to Naimer, Hubert Laurenz. Resetting device for manually operable rotary switch. 4,390,855, Cl. 335-166.000.

Altizer, John W.: *See*—
Fong, Calvin C.; Altizer, John W.; Arnold, Vernon E.; and Lawson, John K., 4,389,820, Cl. 51-410.000.

Aluminum Company of America: *See*—
Levendusky, Thomas L.; and Burton, William L., 4,390,653, Cl. 524-322.000.
Yu, Ho, 4,390,364, Cl. 75-67.00A.

Amana Refrigeration, Inc.: *See*—
Bucksbaum, Arnold M.; and Austin, Buddy J., 4,390,767, Cl. 219-10.55D.

Amemiya, Masahiro: *See*—
Sueyoshi, Toshinobu; Hirai, Shigeo; and Amemiya, Masahiro, 4,390,361, Cl. 75-0.5BA.

American Cyanamid Company: *See*—
Grudzinskas, Charles V.; Chen, Sow-Mei L.; and Wissner, Allan, 4,390,711, Cl. 549-465.000.
Peake, Steven L., 4,390,707, Cl. 549-214.000.
Sloboda, Adolph E., 4,390,545, Cl. 424-275.000.

American Davidson, Inc.: *See*—
Langlois, Henry J.; Hart, Dean W.; and Blazek, Gary J., 4,390,321, Cl. 417-15.000.

American Dental Association Health Foundation: *See*—
Argentar, Harold, 4,390,714, Cl. 560-36.000.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,390,031, Cl. 131-336.000.

American Hoechst Corporation: *See*—
Pomeroy, Keith H., 4,390,903, Cl. 358-282.000.
American Sign & Indicator Corporation: *See*—
Seibert, Lloyd; and Ellefsen, George E., 4,389,804, Cl. 40-447.000.
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., to Institut Francais du Petrole. Process for treating aqueous streams containing aluminum. 4,390,431, Cl. 210-724.000.
AMP Incorporated: *See*—
Casey, Daniel T., 4,389,769, Cl. 29-751.000.
Showman, Robert L.; and Weber, Robert N., 4,390,224, Cl. 339-75.0MP.
Anderson, Carl. Window and door trim for use with siding. 4,389,824, Cl. 52-211.000.
Anderson, James. Photographic distortion method and apparatus. 4,390,272, Cl. 355-84.000.
Anderson, Jerrel C., to Du Pont de Nemours, E. I., and Company. Stabilized ethylene/tetrafluoroethylene copolymers. 4,390,655, Cl. 524-413.000.
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, to Toto, Ltd. Body part cleansing device. 4,389,738, Cl. 4-420.200.
Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, to Showa Highpolymer Co., Ltd. Curable resin composition. 4,390,662, Cl. 525-28.000.
Andreason, Gustav O.; Friberg, Ulf R.; Kuvaja, Heimo H.; and Qvarnstrom, Bengt G. L., to Stora Kopparbergs Bergslags Aktiebolag. Seedling transplant unit. 4,389,814, Cl. 47-73.000.
Andrews, John W., to United States of America, Energy. Hot water tank for use with a combination of solar energy and heat-pump desuperheating. 4,390,008, Cl. 126-427.000.
Andrews, Michael W., to Bell Telephone Laboratories, Incorporated. Circuit for detecting reduction in power. 4,390,871, Cl. 340-659.000.
Annen, Klaus: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Beier, Sybille, 4,390,530, Cl. 424-238.000.
Aoki, Hachiro; Tomita, Hitoshi; and Nagamata, Kiyoshi, to Diesel Kiki Co., Ltd. Distribution type fuel injection pump. 4,389,998, Cl. 123-502.000.
Applegate, Steven L.; and Lloyd, Edward R., to International Business Machines Corporation. Printhead stylus assembly. 4,390,884, Cl. 346-139.00C.
Appleton Electric Company: *See*—
Sviatoslavsky, Nicolas N.; and Kelpin, Charles A., 4,390,114, Cl. 220-337.000.
Arai, Kiyoshi, to Sony Corporation. Method and apparatus for controlling a printer. 4,389,935, Cl. 101-93.010.
Arai, Toshiyuki: *See*—
Nohda, Masao; Umemura, Izumi; and Arai, Toshiyuki, 4,390,255, Cl. 351-212.000.
Arakawa, Masatoshi: *See*—
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, 4,390,717, Cl. 560-114.000.
Argentar, Harold, to American Dental Association Health Foundation. Tertiary aromatic amine accelerators in acrylic resin. 4,390,714, Cl. 560-36.000.
Arimura, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Position detecting system. 4,390,955, Cl. 364-490.000.
Armco Inc.: *See*—
Fisher, Christopher L., 4,390,306, Cl. 405-124.000.
Arnold, John: *See*—
Kluver, Leroy; and Arnold, John, 4,389,929, Cl. 100-88.000.
Arnold, Vernon E.: *See*—
Fong, Calvin C.; Altizer, John W.; Arnold, Vernon E.; and Lawson, John K., 4,389,820, Cl. 51-410.000.
Arnoux, Jean, to Cesar Arnoux, S.A. Watch casing. 4,390,288, Cl. 368-276.000.
Asada, Akihiro: *See*—
Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; and Iwasaki, Syunji, 4,390,747, Cl. 179-1.0SC.
Asahi-Dow Limited: *See*—
Yoshimura, Isao; and Togashi, Takao, 4,390,587, Cl. 428-215.000.
Asahi Glass Company Ltd.: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Moriguchi, Kisoo; and Yoshii, Naoji, 4,390,666, Cl. 525-194.000.
Yasui, Koichi; and Hisano, Jinpei, 4,390,493, Cl. 264-328.160.
Asai, Yasuhiko: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Suyama, Nobuo, 4,390,682, Cl. 528-194.000.
ASEA Aktiebolag: *See*—
Cragfors, Gunnar; and Bosson, Jorgen, 4,390,846, Cl. 330-10.000.
Ashby, Bruce A., to General Electric Company. Ultraviolet light absorbing compositions. 4,390,660, Cl. 524-721.000.
Asher, William J.: *See*—
Davis, Thomas A.; and Asher, William J., 4,390,521, Cl. 424-36.000.
Ashland Oil, Inc.: *See*—
Daniel, Chelliah, 4,390,725, Cl. 562-599.000.
Daniel, Chelliah, 4,390,728, Cl. 568-431.000.
Gruber, Bruce A., 4,390,675, Cl. 526-273.000.
Myers, George D., 4,390,415, Cl. 208-113.000.
Walters, Paul W.; Benslay, Roger M.; and Barger, Dwight F., 4,390,503, Cl. 422-147.000.
Whitlock, Dellas M., 4,389,867, Cl. 72-126.000.
Astro Development Corporation: *See*—
Dudek, Harold M., 4,389,908, Cl. 74-711.000.
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., to Bellofram Corporation. Rolling diaphragm vacuum control. 4,390,036, Cl. 137-116.500.
Atlanta Grotnes Machine Company: *See*—
Grotnes, Carl C., II, 4,389,875, Cl. 72-393.000.
Atlantic Richfield Company: *See*—
Nicholson, Harold L., 4,390,663, Cl. 525-53.000.
Audeh, Costandi A., to Mobil Oil Corporation. Co-processing of residual oil and coal. 4,390,409, Cl. 208-8.0LE.
Audeh, Costandi A., to Mobil Oil Corporation. Process for the production of fuels and metal values. 4,390,410, Cl. 208-8.0LE.
Audesse, Emery G.; Kendrick, George B.; and Chavan, Pratap P., to GTE Products Corporation. Projection unit with separable lamp capsule and means for ejecting same. 4,390,935, Cl. 362-306.000.
Auer-Sog Glaswerke GmbH: *See*—
Willing, Achim, 4,390,934, Cl. 362-291.000.
Augustin, Hans-Georg: *See*—
Kriechbaum, Karl; Augustin, Hans-Georg; and Hoffmann, Dietrich, 4,390,764, Cl. 200-148.00A.
Austin, Buddy J.: *See*—
Bucksbaum, Arnold M.; and Austin, Buddy J., 4,390,767, Cl. 219-10.55D.
Austin, Richard G.: *See*—
Michaelson, Robert C.; and Austin, Richard G., 4,390,739, Cl. 568-860.000.
Autelca, AG: *See*—
Siegenthaler, Fritz, 4,390,296, Cl. 400-608.000.
Automation Industries, Inc.: *See*—
Carter, David P. E., 4,390,222, Cl. 339-45.00M.
Avar, Geza: *See*—
Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, 4,390,640, Cl. 521-51.000.
Axelrod, Robert J., to General Electric Company. Diphenyl pentaerythritol diphosphonate. 4,390,477, Cl. 260-927.00R.
Ayata, Naoki: *See*—
Hatanaka, Katsunori; Uzawa, Shunichi; Hirai, Yutaka; and Ayata, Naoki, 4,390,791, Cl. 250-578.000.
B.N.F. Metals Technology Centre: *See*—
Bowers, John E., 4,390,363, Cl. 75-63.000.
Baakman, Hendrik J.: *See*—
Van Kampen, Hendrik; Rouland, Joseph G.; and Baakman, Hendrik J., 4,390,900, Cl. 358-147.000.
Babcock, Clarence O., to United States of America, Interior. Borehole gauge for in-situ measurement of stress and other physical properties. 4,389,896, Cl. 73-784.000.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Kajiyama, Shigeru, 4,389,894, Cl. 73-637.000.
Babcock, William E.; and Wendt, Frank S., to RCA Corporation. Television receiver ferroresonant power supply using a two-material magnetizable core arrangement. 4,390,819, Cl. 315-411.000.
Bach, Dieter; Jackle, Heiner G.; and Marquardt, Kurt. Method and apparatus for determining the colloid index in liquids. 4,389,879, Cl. 73-61.00R.
Backes, Earl L.: *See*—
Wilgus, William D.; and Backes, Earl L., 4,390,098, Cl. 209-571.000.
Bahlinger, Walter, to Siemens Aktiengesellschaft. Semiconductor component with a plurality of semiconductor elements. 4,390,891, Cl. 357-79.000.
Bahrle, Friedrich; Binder, Hellmuth; Meyer, Wolfram; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Transverse guide roller arrangement for a track guided vehicle. 4,389,945, Cl. 104-247.000.
Bak, Chan S.: *See*—
Gaven, Joseph V., Jr.; and Bak, Chan S., 4,390,291, Cl. 374-160.000.
Bake, Willem J. H. Container. 4,390,282, Cl. 366-40.000.
Baker, William H. Automated surge weir and rim skimming gutter flow control system. 4,389,739, Cl. 4-512.000.
Bako, Lazlo, to Presto Lock, Inc. Combination locks. 4,389,863, Cl. 70-312.000.
Balducci, Luigi; and Rustioni, Massimo, to Montedison S.p.A. Rutile (TiO_2) pigments coated with (1) trigonal anhydrous alumina (Al_2O_3) and (2) cubic metal aluminate ($MeAl_2O_4$) (Me=Co, Ni, Cu, Zn, Mg) and process. 4,390,374, Cl. 106-300.000.
Baldwin Piano & Organ Company: *See*—
Uetrecht, Dale M.; and Simmons, Carlton J., Jr., 4,389,914, Cl. 84-1.010.
Ball Corporation: *See*—
Wilgus, William D.; and Backes, Earl L., 4,390,098, Cl. 209-571.000.
Wilson, Rosser S., 4,390,910, Cl. 360-77.000.
Balloon Works, Inc., The: *See*—
Barnes, Tracy L.; and Murphy, Christy A., 4,390,149, Cl. 244-31.000.
Balogh, Louis J.; Fitzhugh, Raymond L.; Kimes, Dale S.; and Weinstein, Myron, to Goodyear Tire & Rubber Company, The. Apparatus and method for measuring roll diameters. 4,389,788, Cl. 33-178.00D.
Banitt, Elden H., to Riker Laboratories, Inc. Phenolic derivative. 4,390,716, Cl. 560-65.000.
Bank, Herbert M.: *See*—
Rubenstein, Irving H.; and Bank, Herbert M., 4,390,553, Cl. 426-138.000.
Banks, Arthur J., to RCA Corporation. TV Sync generator system for PAL standards. 4,390,892, Cl. 358-17.000.

Barger, Dwight F.: *See*—
Walters, Paul W.; Benslay, Roger M.; and Barger, Dwight F., 4,390,503, Cl. 422-147.000.

Barlage, Bruno, to H. Niemeyer Sohne GmbH & Co. KG. Soil working machine. 4,390,070, Cl. 172-54.500.

Barmag Barmer Maschinenfabrik AG: *See*—
Oberstrass, Detley, 4,389,841, Cl. 57-340.000.

Barnes, James E., to Cox, James M., a part interest. Adjustable ankle stirrup device for a chiropractic table. 4,390,173, Cl. 269-328.000.

Barnes, Tracy L.; and Murphy, Christy A., to Balloon Works, Inc., The. Balloon envelope and method of fabricating same. 4,390,149, Cl. 244-31.000.

Barnette, Luverne H.; and Liang, Charles C., to Duracell Inc. Solid state cell with anolyte. 4,390,446, Cl. 252-182.100.

Bartelink, Everhard H. B. Remote supervisory system. 4,390,750, Cl. 179-5.00R.

Barthelmess, Ulrich, to OMYA GmbH. Centrifugal classifier. 4,390,419, Cl. 209-11.000.

Bartholomay, Donald O., to Gustafson, Inc. Automatic crosscut sampler. 4,389,906, Cl. 73-863.550.

Bartholomew, Victor L., to Hudson Oxygen Therapy Sales Company. Percussor assembly. 4,390,013, Cl. 128-55.000.

Bartl, James C., to Label-Aire Inc. Label applicator and method for labeling the forward faces of articles. 4,390,386, Cl. 156-235.000.

BASF Aktiengesellschaft: *See*—
Lach, Dietrich, 4,390,340, Cl. 8-94.240.

BASF Farben & Fasern A.G.: *See*—
Buchholz, Hagen; Johannsmeier, Hans-Dieter; and Vock, Friedrich, 4,390,126, Cl. 239-1.000.

BASF Wyandotte Corporation: *See*—
Schwartz, Ellen S.; and Tincher, Cline A., 4,390,439, Cl. 252-73.000.
Schwartz, Ellen S.; and Tichner, Cline A., 4,390,440, Cl. 252-76.000.

Batchelder, J. Samuel. Method and apparatus for dielectrophoretic manipulation of chemical species. 4,390,403, Cl. 204-180.00R.

Bate, Gary W.: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,390,398, Cl. 203-18.000.

Bauer, Robert, to Miles Laboratories, Inc. Method and device for detecting glucose concentration. 4,390,621, Cl. 435-14.000.

Baumann, Hanns U., to Sharon K. Baumann Trust. Simplified construction system. 4,389,831, Cl. 52-741.000.

Baumann, Hans, to Grob & Co. Aktiengesellschaft. Heddle frame stave. 4,390,045, Cl. 139-91.000.

Baumbach, Bertram W., to Reliance Electric Company. Line protector and related termination arrangement. 4,390,921, Cl. 361-119.000.

Baxter Travenol Laboratories, Inc.: *See*—
Garver, Edward B., Sr., 4,390,668, Cl. 525-444.000.
Kopp, Clinton V., 4,390,575, Cl. 428-36.000.

Bayer Aktiengesellschaft: *See*—
Ebneth, Harold; and Klipfel, Siegfried, 4,390,588, Cl. 428-263.000.
Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, 4,390,640, Cl. 521-51.000.
von Bonin, Wulf, 4,390,672, Cl. 526-209.000.

BBC Brown, Boveri & Company, Limited: *See*—
Kehlhofer, Rolf, 4,389,847, Cl. 60-659.000.

Beattie, Thomas R.; Hannah, John; and Johnston, David B. R., to Merck & Co., Inc. Cephalosporin compounds. 4,390,693, Cl. 542-442.000.

Beavan, Stuart W., to Lever Brothers Company. Machine dishwashing composition. 4,390,441, Cl. 252-96.000.

Becher, Albert F.: *See*—
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,389,947, Cl. 109-1.00S.

Becka Michael M., to International Shoe Machine Corporation. Molding an insole and attaching the molded insole to a last bottom. 4,389,745, Cl. 12-142.00T.

Becker, Kunibert; Kirchbrucher, Rudiger; Lagodka, Gunter; and Pohlmann, Klaus-Dieter, to Gewerkschaft Eisenhutte Westfalia. Advance mechanism for a mine roof support assembly. 4,390,308, Cl. 405-299.000.

Beckman Instruments, Inc.: *See*—
Meyer, Richard C., 4,390,283, Cl. 366-142.000.

Beehler, Richard F., to Heil-Quaker Corporation. Terminal block and capacitor mount for blower. 4,390,219, Cl. 339-14.00R.

Beer, Hans, to Chemie Linz Aktiengesellschaft. Process for the preparation of 1,2,4-triazole. 4,390,704, Cl. 548-262.000.

Behnert, Reinhard, to Vereinigte Flugtechnische Werke GmbH. Power unit with gas turbine. 4,389,842, Cl. 60-39.360.

Behrend, Paul. Spraying gun for metal spraying. 4,390,127, Cl. 239-83.000.

Beier, Sybille: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Beier, Sybille, 4,390,530, Cl. 424-238.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alferness, Rodney C., 4,390,236, Cl. 350-96.140.
Andrews, Michael W., 4,390,871, Cl. 340-659.000.
Broyer, Alfred P., 4,390,120, Cl. 228-180.00R.
Capasso, Federico; Hutchinson, Albert L.; and Logan, Ralph A., 4,390,889, Cl. 357-30.000.
Coyne, Kevin N.; and Curtis, Hazen, III, 4,390,225, Cl. 339-88.00R.
Gosling, Franz T.; and Louzon, Theodore J., 4,390,589, Cl. 428-381.000.

Bellofram Corporation: *See*—
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., 4,390,036, Cl. 137-116.500.

Benasutti, John E., to Burroughs Corporation. Electrical connector assembly for an integrated circuit package. 4,390,220, Cl. 339-17.0CF.

Bendix Corporation, The: *See*—
Browning, David R.; Sima, Gordon R., Jr.; Schmidt, John C.; and Sickenberger, David W., 4,390,784, Cl. 250-287.000.
Donaldson, Robert D., 4,389,781, Cl. 33-1.00M.
Niles, Paul D.; and Normann, Richard W., 4,390,221, Cl. 339-17.00M.

Benecke, Wilhelm; and Rosenberg, Heinz, to Siemens Aktiengesellschaft. Static magnetic frequency multiplies. 4,390,941, Cl. 363-174.000.

Beningfield, Harley W.; and Wilt, Donna F., to Rockwell International Corporation. Electronic system and method for self-calibration of instrument landing systems. 4,390,949, Cl. 364-429.000.

Benslay, Roger M.: *See*—
Walters, Paul W.; Benslay, Roger M.; and Barger, Dwight F., 4,390,503, Cl. 422-147.000.

Beppu, Masazo: *See*—
Inoue, Yasuhiko; Wake, Shigeo; Sirafuji, Tamio; and Beppu, Masazo, 4,390,736, Cl. 568-801.000.

Berger, Richard M., to American Filtrona Corporation. Tobacco filter. 4,390,031, Cl. 131-336.000.

Bergeron, David L.; and Patel, Parsotam T., to International Business Machines Corporation. Saturation-limited bipolar transistor device. 4,390,890, Cl. 357-44.000.

Bergvall, Bengt A., to Husqvarna. Sewing machine for sewing fancy seams. 4,389,953, Cl. 112-158.00E.

Berisch, Volker, to ITT Industries, Inc. Deceleration-sensitive braking pressure control device. 4,390,213, Cl. 303-24.00A.

Berk, Donald M.; Jacoby, Charles E.; and Reagan, Larry, to SI Handling Systems Inc. Driverless vehicle conveyor system. 4,389,941, Cl. 104-49.000.

Bernheim, Willy: *See*—
Deiner, Hans; and Bernheim, Willy, 4,390,650, Cl. 524-266.000.

Bertelsen, Corey A., to Chevron Research Company. Process for burning retorted oil shale and improved combustor. 4,389,950, Cl. 110-235.000.

Berthold, Fritz; Kolehmainen, Seppo; and Tarkkanen, Veikko. Use of a method, particularly an automatic method, for measuring light as well as improvements and apparatuses for carrying out the same. 4,390,274, Cl. 356-36.000.

Bertone, Gregory A.; and Bossart, Clayton J., to Mine Safety Appliances Company. Indicating system for atmospheric pump arrangement. 4,389,903, Cl. 73-863.030.

Bes, Louis, to Framatome. Unclogging and recovering device for sludge deposited on the tube plate of a steam generator. 4,390,034, Cl. 134-104.000.

Best, David W., to Rockwell International Corporation. Multiple input master/slave flip flop apparatus. 4,390,987, Cl. 370-112.000.

Best, David W.; and Russell, Jeffrey D., to Rockwell International Corporation. Efficierz means for implementing many-to-one multiplexing logic in CMOS/SOS. 4,390,988, Cl. 370-113.000.

Best, Gary: *See*—
Orosaki, Richard J.; Aberer, James B.; and Best, Gary, 4,389,780, Cl. 30-408.000.

Bester, Horst: *See*—
Niehaus, Norbert; Popperling, Rolf; and Bester, Horst, 4,390,367, Cl. 75-125.000.

Betts, William L.; and Martinez, Kenneth, to Paradyne Corporation. Telephone system ring period detector. 4,390,843, Cl. 328-138.000.

Beukema, Duane M.: *See*—
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.

Beyen, Heinrich, to Reederei und Spedition "Braunkohle" GmbH. Apparatus for accommodating a substance to be shielded from the environment. 4,390,040, Cl. 137-340.000.

Biava, Dominique; Cornu, Jean; Detriche, Jean-Marie; Galera, Richard; Tiret, Bernard; and Marchal, Paul, to Commissariat a l'Energie Atomique. Automatic and self-adapting process for fusion-welding a joint between two surfaces. 4,390,775, Cl. 219-124.340.

Biedermann, Ernst; Findeis, Gunter; Weber, Klaus; and Zahn, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Photographic copier. 4,390,270, Cl. 355-46.000.

Bigham, Bobby J., to Peppers, James M. Caulking gun. 4,390,115, Cl. 222-326.000.

Binder, Hellmuth: *See*—
Bahrle, Friedrich; Binder, Hellmuth; Meyer, Wolfram; and Wulf, Helmut, 4,389,945, Cl. 104-247.000.

Bione, Angelo A., to Marmon Company. Musical instrument including electronic sound reverberation. 4,389,915, Cl. 84-1.240.

BioResearch Inc.: *See*—
Kurtz, Leonard D., 4,390,492, Cl. 264-255.000.

Biran, Benjamin; and Biran, Miriam. Foot-operated exercising device. 4,390,177, Cl. 272-73.000.

Biran, Miriam: *See*—
Biran, Benjamin; and Biran, Miriam, 4,390,177, Cl. 272-73.000.

Bird, Stanford W. Container lid having vent means. 4,390,113, Cl. 220-306.000.

Bitterly, Jack G. Vacuum chamber and method of creating a vacuum. 4,389,794, Cl. 34-5.000.

Biwa, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor light-emitting display device. 4,390,810, Cl. 313-500.000.

Bizzozero, Piero: *See*—
De Micheli, Angelo; and Bizzozero, Piero, 4,390,727, Cl. 568-422.000.

Bjorklund, Glenn J.; and Phillips, Charles E., to Southern California Edison Co., Inc. Electric utility demand limiting device and method. 4,390,876, Cl. 340-825.170.

Black & Decker Inc.: *See*—
Overbury, Douglas G.; and McDougall, Robert J., 4,389,779, Cl. 30-382.000.

Blacknell Buildings Limited: *See*—
Brooks, Douglas H. M., 4,390,578, Cl. 428-57.000.

Blair, Daniel R.; Lomneth, Richard B.; Prosise, Robert L.; and Tao, Bernard T., to Procter & Gamble Company, The. Margarine oil product. 4,390,561, Cl. 426-607.000.

Blanc, Maurice: *See*—
Chiovini, Jacky; Blanc, Maurice; and Margolis, Geoffrey, 4,390,698, Cl. 544-274.000.

Blauschild, Robert A., to Signetics. Linear transconductance amplifier. 4,390,848, Cl. 330-151.000.

Blazek, Gary J.: *See*—
Langlois, Henry J.; Hart, Dean W.; and Blazek, Gary J., 4,390,321, Cl. 417-15.000.

Block, Charles; and Mintz, Leon, to Joseph Galkin Corporation. Belt loop setting system. 4,389,957, Cl. 112-262.300.

Blytas, George C., to Shell Oil Company. Sulfur separation process. 4,390,516, Cl. 423-573.00R.

Board of Overseers of Goshen College: *See*—
Jacobs, Merle E., 4,390,341, Cl. 8-424.000.

Bocinski, Terrance E.; and Knight, Alan D., to International Business Machines Corporation. Tri-lead cable housing removal tool. 4,389,770, Cl. 29-764.000.

Bock, Mark G.; and Di Pardo, Robert M., to Merck & Co., Inc. Intermediates for the resolution of some interphenylene-9-thia-11-oxo-12-azaprostanoic acids. 4,390,703, Cl. 548-187.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Branched chain olefinic, alcohols, thiols, esters and ethers, organoleptic uses thereof, processes for preparing same and intermediates therefor. 4,390,443, Cl. 252-174.110.

Boden, Richard M.; Licciardello, Michael; Maisano, Joseph J., Jr.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Perfumed stable aqueous hypochlorite bleach compositions containing 2-methyl-2-octanol and thickened variation thereof. 4,390,448, Cl. 252-187.260.

Boden, Richard M., to International Flavors & Fragrances Inc. Aliphatic branched olefin dioxolanes, dithiolanes, and oxathiolanes and uses thereof in augmenting or enhancing the aroma and/or taste of consumable materials. 4,390,462, Cl. 252-522.00R.

Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of perfume compositions and colognes utilizing alkyl, aralkyl, and bicycloalkyl methyl carbonates. 4,390,463, Cl. 252-522.00R.

Boden, Richard M.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,390,435, Cl. 252-8.600.

Boeing Company, The: *See*—
Whitener, Philip C., 4,390,150, Cl. 244-45.00R.

Boeni, Hans; Meier, Beda; and Szacsvay, Gabor, to Hilti Aktiengesellschaft. Forming engagement grooves in a tool shank. 4,389,870, Cl. 72-354.000.

Boerema, Edward T.: *See*—
Flowerday, Carl; Marcus, Konrad H.; Kempkers, Gordon; Boerema, Edward T.; and Fleming, Dennis J., 4,390,202, Cl. 296-97.00K.

Boerung-Gebrauchsartikel GmbH: *See*—
Runge, Hermann, 4,390,928, Cl. 362-101.000.

Bolick, Stephen M.; and Vought, John O. Pressure regulator assembly guard. 4,389,890, Cl. 73-431.000.

Bonar Industries Inc.: *See*—
Cuthbertson, Bruce, 4,390,051, Cl. 150-1.000.

Bond Cote of Virginia, Inc.: *See*—
Holden, Durrell W., 4,390,585, Cl. 428-172.000.

Bond, John A.; Li, Yuan-Lu; and Crane, Leslie J., to Northern Telecom Limited. Scrambling and unscrambling video signals in a pay TV system. 4,390,898, Cl. 358-119.000.

Bononi, Walter. Pad of high elasticity. 4,390,256, Cl. 351-139.000.

Bookbinder, Carl. Window mirror. 4,390,240, Cl. 350-258.000.

Borak, Josef. Watering valve-bracket for rabbits and small fur bearing animals. 4,389,977, Cl. 119-72.500.

Bossart, Clayton J.: *See*—
Bertone, Gregory A.; and Bossart, Clayton J., 4,389,903, Cl. 73-863.030.

Bosson, Jorgen: *See*—
Cragfors, Gunnar; and Bosson, Jorgen, 4,390,846, Cl. 330-10.000.

Bottcher, Bodo K.; and Wilck, Manfred O., to Raychem GmbH. Enclosures for electrical apparatus, cable and enclosure combinations, and kits and methods for their construction. 4,390,745, Cl. 174-73.00R.

Bowden, Larry D.; Miyashita, Albert H.; and Ravenelle, Charles I., to International Business Machines Corporation. Layered electrophotographic imaging element, apparatus and method sensitive to gallium arsenide laser, the element including two charge generation layers and a polycarbonate adhesive layer. 4,390,610, Cl. 430-58.000.

Bowers, John E., to B.N.F. Metals Technology Centre. Continuous method for removing copper from lead. 4,390,363, Cl. 75-63.000.

Bowers, Kenneth E.; and Markley, Charles E., to Ethyl Development Corporation. Blow pin assembly. 4,390,338, Cl. 425-525.000.

Boyesen, Eyvind, to Performance Industries, Inc. Internal combustion engine fuel supply system. 4,389,982, Cl. 123-73.00R.

Boykins, James L., Jr. Uniform for Karate and the like. 4,389,733, Cl. 2-2.000.

Brantl, Victor; Henschen, Agnes; Teschemacher, Hansjorg; and Lottspeich, Friedrich. Pharmacologically active peptides and medicaments containing the same. 4,390,527, Cl. 424-177.000.

Bratten, Jack R. Filtration apparatus. 4,390,428, Cl. 210-400.000.

Braun Aktiengesellschaft: *See*—
Knoll, Dieter, 4,390,108, Cl. 220-228.000.

Braverman, Leonard W.: *See*—
Sojka, Richard J.; Braverman, Leonard W.; Guch, Steve, Jr.; and Clark, David J., 4,390,993, Cl. 372-87.000.

Braxmeier, Hans: *See*—
Stahlecker, Hans; and Braxmeier, Hans, 4,389,837, Cl. 57-16.000.

Brazel, James P., to General Electric Company. Alumina-alumina composite. 4,390,583, Cl. 428-113.000.

Brenner, Richard K. Container bag system for bicycles. 4,390,088, Cl. 190-51.000.

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Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., 4,390,347, Cl. 48-197.00R.
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Bridges, Charles D.: *See*—
McGee, John K.; Lafferty, Harold L.; Bridges, Charles D.; and Smith, Archie L., 4,390,186, Cl. 277-236.000.

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Hanotier, Jacques D. V.; Bridoux, Monique J. S.; and Dauby, Jacques F., 4,390,472, Cl. 260-398.600.

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Briner, Emil; Clement, Heinz; and Eberli, Heiner, to Rieter Machine Works Limited. Method of producing a staple fibre sliver and apparatus for implementing the method. 4,389,752, Cl. 19-0.560.

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Brister, Eneas E.; and Williams, Frederick P., to Monarch Marking Systems, Inc. Composite label web. 4,390,577, Cl. 428-42.000.

Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,390,701, Cl. 546-235.000.

Bromley, Charles: *See*—
Graetz, Clive W.; Thompson, Morice W.; and Bromley, Charles, 4,390,658, Cl. 524-512.000.

Brooks, Douglas H. M., to Blacknell Buildings Limited. Method of joining members. 4,390,578, Cl. 428-57.000.

Brossi, Arnold; Schmidhammer, Helmut; and Jacobson, Arthur E., to United States of America, Health and Human Services. 6-Keto-morphinans belonging to the 14-hydroxy-series. 4,390,699, Cl. 546-74.000.

Brown, Boveri & Cie AG: *See*—
Lau, Waldemar, 4,390,920, Cl. 361-75.000.

Brown, Charles A., to Control Data Corporation. Demultiplexing plural data streams. 4,390,980, Cl. 370-19.000.

Brown, Edgar D., Jr., to General Electric Company. Phenyl-containing organopolysiloxanes. 4,390,651, Cl. 524-267.000.

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Mueller, Fredrick N.; and Brown, Henry C., 4,390,216, Cl. 308-6.00R.

Brown, Jack; and Wurst, John W., to Singer Company, The. Motor control system incorporating top speed limiting arrangement. 4,390,823, Cl. 318-331.000.

Brown, Jack, to Singer Company, The. Full wave motor control circuit. 4,390,824, Cl. 318-331.000.

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Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., 4,390,885, Cl. 346-140.00R.

Browning, David R.; Sima, Gordon R., Jr.; Schmidt, John C.; and Sickenberger, David W., to Bendix Corporation, The. One piece ion accelerator for ion mobility detector cells. 4,390,764, Cl. 250-287.000.

Broyer, Alfred P., to Bell Telephone Laboratories, Incorporated. Soldering methods and apparatus. 4,390,120, Cl. 228-180.00R.

Broyles, Harry C., to Raychem Corporation. Enhanced recovery memory metal device. 4,390,599, Cl. 428-597.000.

Bruce, Charles R.; and Johnson, Irvin D., to Marathon Oil Company. Method and apparatus for the detection of pipeline holidays. 4,390,836, Cl. 324-54.000.

Bruttel, Beat; and Pfenninger, Heinz, to Ciba-Geigy Corporation. Process for the preparation of solid composition of water-soluble dyes. 4,390,342, Cl. 8-524.000.

BTI Computer Systems: *See*—
Quackenbush, William L.; Porter, Stephen C.; and Cargile, William P., 4,390,944, Cl. 364-200.000.

Buchholz, Hagen; Johannsmeier, Hans-Dieter; and Vock, Friedrich, to BASF Farben & Fasern A.G. Process for supplying painting lines with paint. 4,390,126, Cl. 239-1.000.

Buckeye Cellulose Corporation, The: *See*—
Franz, Norman J.; and Reynolds, Elizabeth B., 4,389,734, Cl. 2-59.000.

Bucksbaum, Arnold M.; and Austin, Buddy J., to Amana Refrigeration, Inc. Windowed and choked combination oven door. 4,390,767, Cl. 219-10.55D.

Budai, Miklos: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.

Budden, Raymond G.; and Scott, Fraser, to Ring Sights Limited. Collimator gunsight. 4,390,276, Cl. 356-251.000.

Buder, Wolfgang: *See*—
Karl, Alfons; Buder, Wolfgang; and Kleinschmit, Peter, 4,390,712, Cl. 556-413.000.

Budzich, Tadeusz. Lubrication and sealing of a free floating piston of hydraulically driven gas compressor. 4,390,322, Cl. 417-243.000.

Budzynski, Andrei Z.: *See*—
Sawyer, Roy T.; Stent, Gunther S.; Budzynski, Andrei Z.; and Olexa, Stephanie A., 4,390,630, Cl. 435-226.000.

Bullard, Edward M.; and Smith, Gregory M., to Mobil Oil Corporation. Laminar thermoplastic film constructions. 4,390,573, Cl. 428-35.000.

Bulle, Harmanus B.: *See*—
De Vries, Gerhard H. F.; and Bulle, Harmanus B., 4,390,808, Cl. 313-584.000.

Bunas, Norman L.; and Smith, Gertrude I., to Devoke Company. Data splice kit. 4,390,389, Cl. 156-502.000.

Burbach, Henry E., to Combustion Engineering, Inc. Method of manufacturing pulverizer rolls. 4,389,767, Cl. 29-527.100.

Burgin, Kermit H. Method for producing and collecting a liquid extract and a dry by-product from a mash. 4,389,928, Cl. 100-37.000.

Burk, John H. Replacement wear pins and replaceable impeller assembly for impact crusher. 4,390,136, Cl. 241-275.000.

Burke, Michael G.: *See*—
Williams, William H.; and Burke, Michael G., 4,390,982, Cl. 370-67.000.

Burnham, Francis L., to Orangeburg Technologies, Inc. Multiple-stage small temperature differential heat-powered pump. 4,390,323, Cl. 417-253.000.

Burroughs Corporation: *See*—
Benasutti, John E., 4,390,220, Cl. 339-17.0CF.
Hayes, Alan B., 4,390,969, Cl. 364-900.000.
Horky, Joseph F.; and Dockal, Ronald J., 4,390,964, Cl. 364-900.000.
Olsen, John D.; and Allen, Stephen A., 4,390,945, Cl. 364-200.000.
Wu, Ta-Ming; and Gaertner, Gregory E., 4,390,780, Cl. 377-44.000.

Burtelson, Frederick W.: *See*—
Suffi, Louis; Golden, James E.; and Burtelson, Frederick W., 4,390,744, Cl. 174-41.000.

Burton, William L.: *See*—
Levendusky, Thomas L.; and Burton, William L., 4,390,653, Cl. 524-322.000.

Bush, Vannevar, to Massachusetts Institute of Technology. Expansible chamber apparatus and its operation. 4,389,921, Cl. 92-59.000.

Bushnell, Sherman W., Jr. Portable lift with ladder. 4,390,080, Cl. 182-115.000.

Bussjager, Rudy C.: *See*—
Chrostowski, Ronald F.; Bussjager, Rudy C.; and Del Toro, James J., 4,389,851, Cl. 62-81.000.

Butler, James W.; and Colvin, Alex D., to Ford Motor Company. Method of measuring an air to fuel ratio. 4,389,881, Cl. 73-116.000.

Butler, Louis L. Wheel alignment apparatus. 4,389,793, Cl. 33-336.000.

Butscher, Franz, to Motor-und Turbinen-Union GmbH. Air supply and fuel volume control arrangement for an auxiliary combustion chamber of a supercharged internal combustion engine. 4,389,846, Cl. 60-606.000.

Butts, Lawrence D., to Scovill Inc. Electrically controlled latch. 4,390,197, Cl. 292-144.000.

Byrd, William; and Kohke, Stephen J., to Research-Cottrell, Inc. Electrostatic precipitator control. 4,390,831, Cl. 323-240.000.

Bytzek, Max: *See*—
Heinrich, Wolfgang; Hammer, Klaus-Dieter; and Bytzek, Max, 4,390,569, Cl. 427-366.000.

C. E. Shepherd Company, Inc.: *See*—
Sheperd, Charles E., 4,390,478, Cl. 261-6.000.

Cabou, Christian G., to Johnson Controls, Inc. Optimal start programmer. 4,390,959, Cl. 364-557.000.

Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, to International Flavors & Fragrances, Inc. Use of 4-methyl-3-cyclohexene-1-carboxylic acid for enhancing or augmenting the aroma of fabric softener compositions or drier-added articles. 4,390,434, Cl. 252-8.600.

Calfee, Richard V.; and Miner, Jay, to Intermedics, Inc. Implantable device with microprocessor control. 4,390,022, Cl. 128-419.0PG.

Calhoun, L. Owen: *See*—
Thorpe, Frank P.; and Calhoun, L. Owen, 4,390,106, Cl. 220-3.700.

California Institute of Technology: *See*—
Ting, Joseph W., 4,390,844, Cl. 328-142.000.

Callaway, Milton A., to Simmons U.S.A. Corporation. Mattress arrangement having a removable side-insertable center core structure. 4,389,743, Cl. 5-464.000.

Callicoatte, Jerry D. Downhole pump having a power piston and a production piston. 4,390,326, Cl. 417-401.000.

Calvert, Rodney K., to Mead Corporation, The. Method and apparatus for loading bottles into open top bottle carriers. 4,389,832, Cl. 53-48.000.

Camp, Albert T. Coated azide gas generating composition. 4,390,380, Cl. 149-8.000.

Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, to Montedison S.p.A. Process for preparing the mono-methallyl ether of pyrocatechin. 4,390,733, Cl. 568-652.000.

Camsco, Inc.: *See*—
Mueller, Fredrick N.; and Brown, Henry C., 4,390,216, Cl. 308-6.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Defence: *See*—
Tatters, Ronald; Dolman, John E.; and Howell, Donald R., deceased, 4,389,922, Cl. 92-156.000.

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Novak, Milan, 4,389,807, Cl. 43-96.000.

Canfield, Carl M.: *See*—
Patton, John T.; and Canfield, Carl M., 4,390,068, Cl. 166-267.000.

Canon Inc.: *See*—
Furuichi, Masayoshi; Honjo, Takeshi; and Akiba, Nobuo, 4,390,268, Cl. 355-15.000.

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Hatanaka, Katsunori; Uzawa, Shunichi; Hirai, Yutaka; and Ayata, Naoki, 4,390,791, Cl. 250-578.000.
Hirohata, Michio; Ogawa, Yukio; and Taguchi, Tetsuya, 4,390,262, Cl. 354-230.000.
Ikemori, Keiji, 4,390,248, Cl. 350-427.000.
Kato, Masatake, 4,390,251, Cl. 350-467.000.
Machida, Minoru, 4,390,972, Cl. 365-222.000.
Minoura, Kazuo, 4,390,235, Cl. 350-6.100.
Satomura, Hiroshi, 4,389,968, Cl. 118-652.000.
Suzuki, Koji; Inuzuka, Tsuneki; and Kurita, Kenji, 4,390,265, Cl. 355-14.00D.
Takahashi, Yuji, 4,390,175, Cl. 271-157.000.
Yamamoto, Hiroshi; and Uchidoi, Masanori, 4,390,261, Cl. 354-173.000.

Capasso, Federico; Hutchinson, Albert L.; and Logan, Ralph A., to Bell Telephone Laboratories, Incorporated. Photodiode having an InGaAs layer with an adjacent InGaAsP p-n junction. 4,390,889, Cl. 357-30.000.

Capuano, Terry D., to Lamson & Sessions Co., The. Method of mounting a fastener. 4,389,766, Cl. 29-432.200.

Carbaugh, John E.: *See*—
Loehr, Clifford E.; Crawford, Roger A.; Carbaugh, John E.; and Welch, Cletus N., 4,390,512, Cl. 423-474.000.

Cardox Corporation: *See*—
Preiss, Martin D.; and Students, Peter A., 4,390,356, Cl. 62-35.000.

Cargile, William P.: *See*—
Quackenbush, William L.; Porter, Stephen C.; and Cargile, William P., 4,390,944, Cl. 364-200.000.

Carletti, Vittorio: *See*—
Campolmi, Stefano; Carletti, Vittorio; and Marchi, Marcello, 4,390,733, Cl. 568-652.000.

Carluccio, John F. Universal wiper plug for liquid cosmetic products. 4,390,298, Cl. 401-122.000.

Carmer, Richard V.: *See*—
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,390,590, Cl. 428-383.000.

Carniglia, Charles K.: *See*—
Jennings, Daniel T.; Carniglia, Charles K.; and Young, David B., 4,390,787, Cl. 250-459.100.

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Wozniak, Donald R., 4,390,496, Cl. 376-245.000.

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Chrostowski, Ronald F.; Bussjager, Rudy C.; and Del Toro, James J., 4,389,851, Cl. 62-81.000.
Haas, Rudy E.; Smorol, Michael E.; Tobin, Curtis L.; and Walker, James J., Jr., 4,390,059, Cl. 165-76.000.
Hile, James R., 4,389,853, Cl. 62-89.000.

Carter, David P. E., to Automation Industries, Inc. Lanyard release-/umbilical electrical connector. 4,390,222, Cl. 339-45.00M.

Carter, James H., II, to Coulter Electronics, Inc. Stabilization process for biological cells and stabilized compositions thereof. 4,390,632, Cl. 436-10.000.

Carter, Merle F.: *See*—
Kast, Jack L.; Eddy, Albert R.; and Carter, Merle F., 4,389,919, Cl. 89-185.000.

Cartwright, Garry W. Neisseria bacteria species identification and beta lactamase testing methods. 4,390,622, Cl. 435-18.000.

Cary, Lloyd H., to Howmet Aluminum Corp. Suspended ceiling system with crossing clip. 4,389,828, Cl. 52-665.000.

Casey, Daniel T., to AMP Incorporated. Terminating tool which is adjustable to accommodate different centerline spacing. 4,389,769, Cl. 29-751.000.

Casio Computer Co., Ltd.: *See*—
Morishige, Morio, 4,390,287, Cl. 368-240.000.

Cassidy, Michael P.; D'Amico, John F.; DeAngelo, Michael A., Jr.; and Lin, Kon-Mang, to Western Electric Company, Incorporated. Treatment of a substrate surface to reduce solder sticking. 4,389,771, Cl. 29-846.000.

Castro, Albert J., to Westates Space-Era Products, Inc. dba Wespac. Ribbon re-inking machine capable of reloading a variety of types of ribbon cassettes. 4,390,294, Cl. 400-196.100.

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Gibson, Dennis H., 4,389,991, Cl. 123-383.000.

Cecil, Olin B.: *See*—
Robinson, John T.; Cecil, Olin B.; and Shah, Rajiv R., 4,390,392, Cl. 156-643.000.

Celanese Corporation: *See*—
Costanza, John R., 4,390,401, Cl. 204-159.240.
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Gerberich, H. Robert, 4,390,730, Cl. 568-473.000.
Celio, Tino; and Ott, Hans, to GRETAG Aktiengesellschaft. Illumination control for a densitometer and density measuring device having such control. 4,390,280, Cl. 356-445.000.
Censor Patent-und Versuchsanstalt: *See*—
Loebach, Ernst W.; and Sawatzki, Harry L., 4,390,273, Cl. 355-125.000.
Cerberus AG: *See*—
Christen, Peter; and Muller, Peter, 4,390,869, Cl. 340-632.000.
Cernansky, Joseph: *See*—
Rudell, Elliot; Cernansky, Joseph; and Garner, Harold, 4,390,178, Cl. 272-114.000.
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Arnoux, Jean, 4,390,288, Cl. 368-276.000.
Champion International Corporation: *See*—
McLaren, Edwin C.; and Adamek, David J., 4,389,802, Cl. 40-307.000.
Champlin Petroleum Company: *See*—
Patton, John T.; and Canfield, Carl M., 4,390,068, Cl. 166-267.000.
Chant, Bernard J.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.
Chapman, Ward W. Sheet metal protective cover for awning windows. 4,389,816, Cl. 49-62.000.
Chard, James W., Jr.; and Corrigan, Timothy F., to Drying Systems, Inc. Apparatus for conveying sheets such as veneer having improved wicket construction. 4,390,093, Cl. 198-654.000.
Chauvel, Bernard, to Rhone-Poulenc Industries. Interpolymer latex and process for the preparation thereof. 4,390,597, Cl. 428-512.000.
Chauvin, Yves: *See*—
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., 4,390,431, Cl. 210-724.000.
Chavan, Pratap P.: *See*—
Audesse, Emery G.; Kendrick, George B.; and Chavan, Pratap P., 4,390,935, Cl. 362-306.000.
Cheetham, William J.: *See*—
Elkateb, Makeen M.; and Cheetham, William J., 4,390,835, Cl. 324-51.000.
Chemie Linz Aktiengesellschaft: *See*—
Beer, Hans, 4,390,704, Cl. 548-262.000.
Chemische Werke Huels, A.G.: *See*—
Schuler, Ralf; and Maahs, Gunther, 4,390,654, Cl. 524-413.000.
Chen, Sow-Mei L.: *See*—
Grudzinskas, Charles V.; Chen, Sow-Mei L.; and Wissner, Allan, 4,390,711, Cl. 549-465.000.
Cheng, Yue C. Cord reel assembly. 4,390,142, Cl. 242-96.000.
Chernovol, Arkady V.: *See*—
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Chevron Research Company: *See*—
Bertelsen, Corey A., 4,389,950, Cl. 110-235.000.
O'Rear, Dennis J.; and Mayer, Jerome F., 4,390,413, Cl. 208-61.000.
Chianelli, Russell R.; and Pecoraro, Theresa A., to Exxon Research and Engineering Co. Method of preparing chalocogenides of group VIII by low temperature precipitation from nonaqueous solution, the products produced by said method and their use as catalysts. 4,390,514, Cl. 423-509.000.
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; and Fujimura, Motoki, to Tanabe Seiyaku Co., Ltd. Immobilized aminoacylase. 4,390,626, Cl. 435-176.000.
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., to RCA Corporation. Tuning display for a television receiver. 4,390,902, Cl. 358-192.100.
Chin, Hsiao-Ling M., to Stauffer Chemical Company. N-Tetrachloroethylthio benzoyl anilides useful as acaricides and to control mosquitoes. 4,390,549, Cl. 424-324.000.
Chiovini, Jacky; Blanc, Maurice; and Margolis, Geoffrey, to Societe d'Assistance Technique pour Produits Nestle S.A. Detheobromination of cocoa. 4,390,698, Cl. 544-274.000.
Chisso Corporation: *See*—
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Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,390,402, Cl. 204-180.00P.
Chodnekar, Madhukar S.; Kaiser, Ado; and Kienzle, Frank, to Hoffmann-La Roche Inc. Imidazoquinazolines having pharmaceutical activity. 4,390,540, Cl. 424-251.000.
Chou, Hsin-hsin; and Hendrickson, William A., to Minnesota Mining and Manufacturing Company. Charge transfer imaging process. 4,390,607, Cl. 430-48.000.
Chow, Philip Y., to T. Y. Lin International. Prestressed concrete pressure vessels with increased pressure-retaining capability. 4,389,825, Cl. 52-224.000.
Chow, William W.; and Dunn, Larry P., to International Business Machines Corporation. Single track magnetic head assembly. 4,390,916, Cl. 360-127.000.
Christen, Peter; and Muller, Peter, to Cerberus AG. Gas sensing signaling system. 4,390,869, Cl. 340-632.000.
Christen, Werner: *See*—
Durr, Herbert; Christen, Werner; and Muller, Helmut, 4,390,285, Cl. 366-168.000.
Christensen, Edward W., II: *See*—
Key, Charles W.; and Christensen, Edward W., II, 4,390,815, Cl. 315-368.000.
Christensen, Rolf E., to Scott Paper Company. Tension wire meter for impregnating foam with liquid fabric conditioner. 4,389,965, Cl. 118-261.000.
Christman, Chris L., to United States of America, Health and Human Services. Ultrasonic therapy applicator that measures dosage. 4,390,026, Cl. 128-660.000.
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Chubb & Son's Lock and Safe Company Limited: *See*—
Sands, Raymond L.; and Ward, Geoffrey M., 4,389,948, Cl. 109-82.000.
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Goldberg, Alfred L.; Swamy, K. H. Sreedhara; and Chung, Chin H., 4,390,629, Cl. 435-220.000.
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Deiner, Hans; and Bernheim, Willy, 4,390,650, Cl. 524-266.000.
Marky, Michael, 4,390,476, Cl. 260-505.00C.
Rosenberger, Siegfried, 4,390,735, Cl. 568-790.000.
Stanton, James L., 4,390,700, Cl. 546-165.000.
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,390,538, Cl. 424-249.000.
Weiss, Jonas; and Seltzer, Raymond, 4,390,679, Cl. 528-64.000.
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Mizukuchi, Yutaka, 4,390,467, Cl. 252-299.630.
Clarion Co., Ltd.: *See*—
Osaka, Hiroshi; and Honma, Akira, 4,390,899, Cl. 358-120.000.
Clark, Charles A., Jr., to RCA Corporation. Self-starting transformer-coupled FET multivibrators. 4,390,937, Cl. 363-22.000.
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Sojka, Richard J.; Braverman, Leonard W.; Guch, Steve, Jr.; and Clark, David J., 4,390,993, Cl. 372-87.000.
Clarke, Donald H.; Pomranky, George J.; and Schmidt, Donald L., to Dow Chemical Company, The. Isocyanurate foams using a sulfonium zwitterion/metal carbonylate mixture as catalyst. 4,390,644, Cl. 521-121.000.
Clement, Heinz: *See*—
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Clements, C. Dale. Thigh support brace. 4,390,015, Cl. 128-80.00R.
Clifton, Norman L. Tool belt suspenders. 4,389,736, Cl. 2-328.000.
Cody, Ian A., to Exxon Research and Engineering Co. Selective dewaxing of hydrocarbon oil using surface-modified zeolites. 4,390,414, Cl. 208-111.000.
Cogswell, Frederic N.; and Mitchell, David T., to Imperial Chemical Industries Limited. Moulding. 4,390,581, Cl. 428-71.000.
Cohen, Edwin; and Maynard, Jack A., to Singer Company, The. Cockpit display system to reduce vertigo. 4,390,861, Cl. 340-27.00R.
Cokelekoglu, Erden. Press lock system for railing construction. 4,390,164, Cl. 256-65.000.
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., to Fiberglas Canada Limited. Modified process for resin manufacturing using a continuous separate distillation column. 4,390,398, Cl. 203-18.000.
Cole Hersee Company: *See*—
Introvigne, Angelo J., 4,390,761, Cl. 200-67.00C.
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., to Sunbeam Corporation. Electric dry shaver. 4,389,772, Cl. 30-43.900.
Collins, Walter W. Belt buckle and knife. 4,389,775, Cl. 30-156.000.
Colosio Cesare: *See*—
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Colton, D. Frederick: *See*—
Lea, Richard K.; Edwards, Julian D.; and Colton, D. Frederick, 4,390,366, Cl. 75-101.0BE.
Colvin, Alex D.: *See*—
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Colvin, Howard A.; and Muse, Joel, Jr., to Goodyear Tire & Rubber Company, The. Process for the purification of diisopropenylbenzene. 4,390,741, Cl. 585-258.000.
Colvin, Roger D., to United States of America, Air Force. Broad bandwidth surface acoustic wave filter apparatus with staggered tuning. 4,390,854, Cl. 333-193.000.
Combustion Engineering, Inc.: *See*—
Burbach, Henry E., 4,389,767, Cl. 29-527.100.
McGee, John K.; Lafferty, Harold L.; Bridges, Charles D.; and Smith, Archie L., 4,390,186, Cl. 277-236.000.
Tenhaaf, Peter H., 4,390,420, Cl. 209-403.000.
Commereuc, Dominique: *See*—
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., 4,390,431, Cl. 210-724.000.
Commissariat a l'Energie Atomique: *See*—
Biava, Dominique; Cornu, Jean; Detriche, Jean-Marie; Galera, Richard; Tiret, Bernard; and Marchal, Paul, 4,390,775, Cl. 219-124.340.

Commonwealth Scientific and Industrial Research Organization: *See*—
Holan, George; and O'Keefe, David F., 4,390,715, Cl. 424-282.000.
Community Light & Sound, Inc.: *See*—
Howze, Bruce; and Henrickson, Clifford, 4,390,078, Cl. 181-185.000.
Compagnie Industrielle Des Telecommunications Cit-Alcatel: *See*—
Duplessis, Philippe; and Delpit, Philippe, 4,390,983, Cl. 370-77.000.
Comtorgage Corporation: *See*—
Meyer, Franklin, Jr., 4,389,789, Cl. 33-178.00R.
Connelly, Arthur J.: *See*—
Martin, T. Edward, 4,389,885, Cl. 73-151.500.
Conoco Inc.: *See*—
Moore, J. Scott, 4,390,066, Cl. 166-245.000.
Conrad, Willibrod, to Lucas Industries Limited. Automatic adjusters for drum brakes. 4,390,086, Cl. 188-79.50B.
Consan Pacific Incorporated: *See*—
Saurenman, Donald G., 4,390,923, Cl. 361-222.000.
Consilvio, Arthur. Solar boiler. 4,390,009, Cl. 126-439.000.
Container Corporation of America: *See*—
Outler, Charles R.; and Hampton, William A., 4,390,154, Cl. 248-346.000.
Continental Group, Inc., The: *See*—
Tysver, Oliver J., 4,390,112, Cl. 220-274.000.
Control Data Corporation: *See*—
Brown, Charles A., 4,390,980, Cl. 370-19.000.
Lane, Thomas A., 4,390,946, Cl. 364-200.000.
Smith, Donald O.; and Harte, Kenneth J., 4,390,789, Cl. 250-492.200.
Control Logic (Proprietary) Limited: *See*—
Murray, Alan B., 4,389,990, Cl. 123-353.000.
Conver Ingenieur-Technik GmbH & Co. KG: *See*—
Gloystein, Jurgen F. G.; and Szirniks, Klaus G., 4,389,761, Cl. 24-287.000.
Converse, Merle E.; and Darilek, Glenn T., to Transaction Control Industries. Battery charger circuit. 4,390,828, Cl. 320-32.000.
Conway, Charles S. Cargo handling system for tanker vessels. 4,389,959, Cl. 114-74.00R.
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Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 4,390,369, Cl. 106-31.000.
Cooper, James L., to Eastman Kodak Company. Recovery of rhodium and cobalt low pressure oxo catalyst. 4,390,473, Cl. 260-429.00R.
Coovert, Cary: *See*—
Hennessy, Richard E.; Frymire, Roger; and Coovert, Cary, 4,390,968, Cl. 364-900.000.
Copar Corporation: *See*—
Johnson, Keith R., 4,389,969, Cl. 118-665.000.
Schmidt, Robert W., 4,389,971, Cl. 118-669.000.
Coppola, A. Gerard, executor: *See*—
Donovan, William J., deceased; Coppola, A. Gerard, executor; and Sanford, William D., 4,390,580, Cl. 428-68.000.
Copyer Co., Ltd.: *See*—
Furuichi, Masayoshi; Honjo, Takeshi; and Akiba, Nobuo, 4,390,268, Cl. 355-15.000.
Corain, Luciano, to Nuovo Pignone S.p.A. Reciprocating device for increasing the weft density in cloth weave fabrics. 4,390,044, Cl. 139-98.000.
Corbefin, Rene; and Vacelet, Gabriel, to Societe Nationale Industrielle Aerospatiale. Process and system for producing photovoltaic power. 4,390,940, Cl. 363-132.000.
Cornforth, Malcolm W.; and Jacobsen, Robert S., to Singer Company, The. Apparatus for correcting measured gas flow. 4,390,956, Cl. 364-510.000.
Corning Glass Works: *See*—
Hoda, Syed N., 4,390,634, Cl. 501-3.000.
Morgan, David W., 4,390,635, Cl. 501-13.000.
Olson, John H.; and Schlaufman, Robert J., 4,390,593, Cl. 428-410.000.
Cornu, Jean: *See*—
Biava, Dominique; Cornu, Jean; Detriche, Jean-Marie; Galera, Richard; Tiret, Bernard; and Marchal, Paul, 4,390,775, Cl. 219-124.340.
Cornwell, Charles E. Method for mixing, spraying and placing cementitious materials. 4,390,371, Cl. 106-88.000.
Corrigan, Timothy F.: *See*—
Chard, James W., Jr.; and Corrigan, Timothy F., 4,390,093, Cl. 198-654.000.
Cosco, Inc. (Tucker Housewares Div.): *See*—
Pirro, Armand, 4,390,110, Cl. 220-318.000.
Cosgrove, James F.; Dahlke, Gerhard P.; and Wurms, Charles, to International Business Machines Corporation. Boatless point source evaporation method. 4,390,571, Cl. 427-43.100.
Costanza, John R., to Celanese Corporation; and Celanese Corporation. Acrylate or methacrylate esters of alkylene oxide adducts of alkyl/aryl phenols as wetting agents for ultraviolet curable coating compositions. 4,390,401, Cl. 204-159.240.
Coulter Electronics, Inc.: *See*—
Carter, James H., II, 4,390,632, Cl. 436-10.000.
Courtney, Robert W.; Parker, Stephen J.; and Threadgold, Alan C. Coating compositions. 4,390,615, Cl. 430-315.000.
Cousens, Donald E.: *See*—
Kurtz, John A.; and Cousens, Donald E., 4,390,771, Cl. 219-56.220.
Cox, James M.: *See*—
Barnes, James E., 4,390,173, Cl. 269-328.000.
Cox, Walter T.; and Tannery, Edward F. Vehicle locking mechanism. 4,390,195, Cl. 292-53.000.
Coyne, Kevin N.; and Curtis, Hazen, III, to Bell Telephone Laboratories, Incorporated. Fuse block assembly. 4,390,225, Cl. 339-88.00R.
Crafco, Inc.: *See*—
Jacobson, Carl C., Jr.; and Manning, Mark C., 4,390,304, Cl. 404-110.000.
Cragfors, Gunnar; and Bosson, Jorgen, to ASEA Aktiebolag. Power amplifier connection. 4,390,846, Cl. 330-10.000.
Craggs, Harold B.; and Weindorfer, Leo. Pelting board. 4,389,795, Cl. 34-103.000.
Cragoe, Edward J., Jr., to Merck & Co., Inc. 1-(Substituted-aminoalkoxyphenyl)-2-methylene-1-alkanones, compositions and use. 4,390,537, Cl. 424-248.580.
Cramer, Rudolph E.; and Ouwerkerk, Johannes H. W., to Hoogovens Ijmuiden B.V. Apparatus for mixing at least one additional gas into a main flow of gas. 4,390,346, Cl. 48-180.00R.
Crane, Leslie J.: *See*—
Bond, John A.; Li, Yuan-Lu; and Crane, Leslie J., 4,390,898, Cl. 358-119.000.
Crawford, Knute S.: *See*—
Twibell, Jerome J.; and Crawford, Knute S., 4,390,943, Cl. 364-200.000.
Crawford, Roger A.: *See*—
Loehr, Clifford E.; Crawford, Roger A.; Carbaugh, John E.; and Welch, Cletus N., 4,390,512, Cl. 423-474.000.
Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,390,701, Cl. 546-235.000.
Croft, Winfred C.: *See*—
Downing, Terry R.; Zorns, John M.; and Croft, Winfred C., 4,390,085, Cl. 188-72.900.
Crompton, Alan W., to Crompton, Alan Woodhouse. Method and apparatus for separating apricot kernels from husks. 4,389,927, Cl. 99-575.000.
Crompton, Alan Woodhouse: *See*—
Crompton, Alan W., 4,389,927, Cl. 99-575.000.
Crutcher Resources Corporation: *See*—
Thompson, Floyd M., Jr., 4,389,765, Cl. 29-426.500.
CTS Corporation: *See*—
Thorpe, Frank P.; and Calhoun, L. Owen, 4,390,106, Cl. 220-3.700.
Cudmore, Patrick J., to Wave-Rider, Inc. Rotary wing device. 4,390,148, Cl. 244-19.000.
Cuffiani, Illaro; Galli, Paolo; and Zucchini, Umberto, to Montedison S.p.A. Catalyst components for polymerizing olefins. 4,390,454, Cl. 252-429.00B.
Cummings, Robert, to U.S. Clinical Products, Inc. Flexible plastic sterile closure system for containers. 4,390,104, Cl. 215-232.000.
Cunningham, Ernest R., to Grip-Pak, Inc. Lay flat tube multi-packaging device for containers. 4,390,095, Cl. 206-150.000.
Curran, Kenneth J. Remote control systems for toy vehicles, and the like. 4,390,877, Cl. 340-825.720.
Current, Karl W., to University of California, The Regents of the. Latched multivalued full adder. 4,390,962, Cl. 364-768.000.
Curtis, Hazen, III: *See*—
Coyne, Kevin N.; and Curtis, Hazen, III, 4,390,225, Cl. 339-88.00R.
Curtis, Huntington W.; Kellogg, Robert M.; Kissinger, Kerry W.; Mappes, Robert P.; and Stephans, Emery J., to International Business Machines Corporation. Chemical analysis system including a test package and rotor combination. 4,390,499, Cl. 422-72.000.
Cuthbertson, Bruce, to Bonar Industries Inc. Securing a liner within a flexible container. 4,390,051, Cl. 150-1.000.
CVI Incorporated: *See*—
Sarcia, Domenico S., 4,389,850, Cl. 62-6.000.
Dages, Daniel, to Saint Gobain Vitrage. Plasticizers for polyvinyl butyral. 4,390,594, Cl. 428-437.000.
Dahlberg, Reinhard, to Licentia Patent Verwaltungs-GmbH. Silicon layer solar cell and method of producing it. 4,390,743, Cl. 136-258.000.
Dahlke, Gerhard P.: *See*—
Cosgrove, James F.; Dahlke, Gerhard P.; and Wurms, Charles, 4,390,571, Cl. 427-43.100.
Daignault, Alan: *See*—
Rothwell, Harold L., Jr.; Gungle, W. Calvin; and Daignault, Alan, 4,390,811, Cl. 315-73.000.
Daikan Kogyo Co., Ltd.: *See*—
Misaki, Susumu; Suefuji, Masahiro; Tsushima, Tadahiko; and Tanida, Hiroshi, 4,390,702, Cl. 546-296.000.
Daikin Kogyo Co., Ltd.: *See*—
Tabushi, Iwao; Shimokawa, Kazuhiro; Naito, Daiji; Misaki, Susumu; and Yoshida, Tsutomu, 4,390,740, Cl. 570-146.000.
Daiku, Nobutaka, to Nippon Electric Glass Company, Limited. X-Ray absorbing glass for a color cathode ray tube having a controlled chromaticity value and a selective light absorption. 4,390,637, Cl. 501-64.000.
Daily, Virgil W., III, to Unarco Industries, Inc. Hinge for cover of kettle cooker. 4,390,002, Cl. 126-25.00R.
Daimler-Benz Aktiengesellschaft: *See*—
Bahrle, Friedrich; Binder, Hellnauth; Meyer, Wolfram; and Wulf, Helmut, 4,389,945, Cl. 104-247.000.
Frankle, Gerhard; and Hase, Friedrich-Wilhelm, 4,389,987, Cl. 123-300.000.
Dainippon Screen Manufacturing Co., Ltd.: *See*—
Henmi, Kojiro; and Takenaka, Kiyosi, 4,390,269, Cl. 355-27.000.
Daiwa Can Company, Limited: *See*—
Wakamatsu, Atsuyuki; and Tonooka, Keisuke, 4,390,135, Cl. 241-101.200.

Dallons, Robert E.; and Fortune, William S., to Edsyn, Inc. Tweezers for removal of dual in-line pin (DIP) components. 4,389,912, Cl. 81-43.000.
Dalrymple, Peirce E. Torque converter. 4,390,089, Cl. 192-105.00B.
D'Amico, John F.: *See*—
Cassidy, Michael P.; D'Amico, John F.; DeAngelo, Michael A., Jr.; and Lin, Kon-Mang. 4,389,771, Cl. 29-846.000.
Daniel, Chelliah, to Ashland Oil, Inc. Oxydehydrogenation process for preparing methacrylic acid and its lower alkyl esters. 4,390,725, Cl. 562-599.000.
Daniel, Chelliah, to Ashland Oil, Inc. Process for conversion of toluene to benzaldehyde. 4,390,728, Cl. 568-431.000.
Daniel Industries, Inc.: *See*—
Geinow, Bernard H., 4,390,171, Cl. 267-169.000.
Daniels, Alexander: *See*—
United States of America, National Aeronautics and Space Administration; Gasser, Max G.; Sherman, Allan; Studer, Philip A.; Daniels, Alexander; and Goldowsky, Michael P., 4,389,849, Cl. 62-6.000.
Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, to Shinagawa Refractories Co., Ltd.; and Sumitomo Metal Industries Co., Ltd. Hot-gunning method for repairing converters. 4,390,166, Cl. 266-44.000.
Dansk Industri Syndikat A/S: *See*—
Grove, Morgens W.; and Eriksen, Carl-Erik, 4,390,056, Cl. 164-7.100.
Darby, Spencer A.: *See*—
Slater, Charles A., Jr.; and Darby, Spencer A., 4,390,936, Cl. 362-390.000.
Dardoufas, Kimon C.: *See*—
Marshall, Robert M.; and Dardoufas, Kimon C., 4,390,591, Cl. 428-391.000.
Darilek, Glenn T.: *See*—
Converse, Merle E.; and Darilek, Glenn T., 4,390,828, Cl. 320-32.000.
Datta, Pabitra; and Poliniak, Eugene S., to RCA Corporation. Doped polyphenylene ether lubricant for high density information discs. 4,390,579, Cl. 428-65.000.
Dauby, Jacques F.: *See*—
Hanotier, Jacques D. V.; Bridoux, Monique J. S.; and Dauby, Jacques F., 4,390,472, Cl. 260-398.600.
Davies, John H.: *See*—
Rosenbaum, Herman S.; and Davies, John H., 4,390,497, Cl. 376-414.000.
Davies, Kenneth W., to Dominion Engineering Works, Ltd. Drive system for edger mill. 4,389,865, Cl. 72-29.000.
Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. {1-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-(2-oxo-1-benzimidazolinyl} piperidines, pharmaceutical compositions and methods of use. 4,390,544, Cl. 424-267.000.
Davis, Thomas A.; and Asher, William J., to Exxon Research and Engineering Co. Artificial red cells. 4,390,521, Cl. 424-36.000.
Davis, William F.; and Shacter, Stuart B., to Motorola, Inc. Operational amplifier having improved slew rate/bandwidth characteristics. 4,390,850, Cl. 330-253.000.
Dayco Corporation: *See*—
Gunter, Jonas L.; Haren, Doyle V.; Hofle, Anatoli; and Medford, Richard D., 4,390,214, Cl. 305-35.00R.
De Forenede Bryggerier A/S: *See*—
Johansen, Jack T., 4,390,628, Cl. 435-189.000.
De Limon Fluhme GmbH & Co.: *See*—
Saretzky, Horst, 4,390,083, Cl. 184-7.00F.
DeAngelo, Michael A., Jr.: *See*—
Cassidy, Michael P.; D'Amico, John F.; DeAngelo, Michael A., Jr.; and Lin, Kon-Mang. 4,389,771, Cl. 29-846.000.
DeBrita, John A.: *See*—
O'Brien, Kirk G.; and DeBrita, John A., 4,390,806, Cl. 310-261.000.
De Ceuster, Jean; and Papageorges, Georges, to Interox. Process for the regeneration of waste paper. 4,390,395, Cl. 162-5.000.
Deex, Oliver D., to Monsanto Company. Liquid crystal copolyesters. 4,390,681, Cl. 528-193.000.
Degussa AG: *See*—
Karl, Alfons; Buder, Wolfgang; and Kleinschmit, Peter, 4,390,712, Cl. 556-413.000.
Merk, Wolfgang; Wagner, Rudolf M.; Werle, Peter; and Nygren, Robert S., 4,390,732, Cl. 568-648.000.
Degussa Aktiengesellschaft: *See*—
Kleemann, Axel; and Schalke, Peter M., 4,390,706, Cl. 349-74.000.
Schwarze, Werner; Kleemann, Axel; and Leuchtenberger, Wolfgang, 4,390,719, Cl. 560-124.000.
Deiner, Hans; and Bernheim, Willy, to Ciba-Geigy Corporation. Process for making fibrous material water repellent. 4,390,650, Cl. 524-266.000.
de Keizer, Cornelis, to IHC Holland N.V. Control system. 4,390,942, Cl. 364-162.000.
Delpit, Philippe: *See*—
Duplessis, Philippe; and Delpit, Philippe, 4,390,983, Cl. 370-77.000.
Delta Kogyo Co., Ltd.: *See*—
Izuno, Sadami; Kiyomitsu, Isao; and Tsuji, Toshihiko, 4,390,209, Cl. 297-410.000.
Del Toro, James J.: *See*—
Chrostowski, Ronald F.; Bussjager, Rudy C.; and Del Toro, James J., 4,389,851, Cl. 62-81.000.
De Micheli, Angelo; and Bizzozero, Piero, to Montedison S.p.A. Process for preparing stable aqueous suspensions of formaldehyde. 4,390,727, Cl. 568-422.000.
Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,390,724, Cl. 562-504.000.
Denz, Helmut; Stumm, Hans-Peter; and Zechnall, Martin, to Robert Bosch GmbH. Internal combustion engine control system for use with turbo-charged engine, and method. 4,389,994, Cl. 123-478.000.
Der Avedisian, Suren: *See*—
Swartley, John S.; and Der Avedisian, Suren, 4,390,551, Cl. 426-107.000.
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX-Pentronix, Inc. Die, punch and core rod assembly for compacting powder material. 4,390,335, Cl. 425-78.000.
DeShon, Wallace E., to Phillips Petroleum Company. Serial line communication system. 4,390,947, Cl. 364-200.000.
Desrosiers, Leo: *See*—
Golan, Michael G.; and Desrosiers, Leo, 4,389,753, Cl. 19-106.00R.
Destrampe, Terry G. Post-shutdown coolant-supply device. 4,389,984, Cl. 123-196.00S.
Detriche, Jean-Marie: *See*—
Biava, Dominique; Cornu, Jean; Detriche, Jean-Marie; Galera, Richard; Tiret, Bernard; and Marchal, Paul, 4,390,775, Cl. 219-124.340.
Detroit Radiant Products Company: *See*—
Rozzi, Mario, 4,390,125, Cl. 237-70.000.
Deutsch, Peter C., to Marine Industries Company. Cord grip for electrical wiring connector devices. 4,390,227, Cl. 339-103.00C.
Deutsche Texaco Aktiengesellschaft: *See*—
Rietsch, Eike, 4,390,973, Cl. 367-40.000.
Deuzeman, Henk J.: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,390,398, Cl. 203-18.000.
Devoke Company: *See*—
Bunas, Norman L.; and Smith, Gertrude I., 4,390,389, Cl. 156-502.000.
De Vries, Gerhard H. F.; and Bulle, Harmanus B., to U.S. Philips Corporation. Picture display device having a gas discharge display panel. 4,390,808, Cl. 313-584.000.
DeWitt, Nick R. Pressure controlled air/water cushion. 4,389,742, Cl. 5-455.000.
Diamond S.A.: *See*—
Marazzi, Silvio, 4,390,237, Cl. 350-96.200.
Diesel Kiki Co., Ltd.: *See*—
Aoki, Hachiro; Tomita, Hitoshi; and Nagamata, Kiyoshi, 4,389,998, Cl. 123-502.000.
Uchida, Kazuo, 4,390,129, Cl. 239-533.500.
DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corp. Layered organophosphorous inorganic polymers containing oxygen bonded to carbon. 4,390,690, Cl. 528-395.000.
Digital Equipment Corporation: *See*—
Hertrich, Friedrich R.; and Perera, Slobodan R., 4,390,912, Cl. 360-78.000.
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., to Texaco Inc. Trim control process for partial oxidation gas generator. 4,390,347, Cl. 48-197.00R.
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., to Texaco Inc. Trim control process for partial oxidation gas generator. 4,390,348, Cl. 48-197.00R.
Dille, Roger M.: *See*—
Skarlos, Leonidas; and Dille, Roger M., 4,390,957, Cl. 364-550.000.
Di Marco, Joel E.: *See*—
Goldsmith, Wesely R.; and Di Marco, Joel E., 4,389,785, Cl. 33-174.00S.
Dines, Martin B.: *See*—
DiGiacomo, Peter M.; and Dines, Martin B., 4,390,690, Cl. 528-395.000.
Diosgyori Gepgyar: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.
Di Pardo, Robert M.: *See*—
Bock, Mark G.; and Di Pardo, Robert M., 4,390,703, Cl. 548-187.000.
Director-General, Agency of Industrial Science & Technology: *See*—
Tanaami, Kazuo; and Matsuda, Nobuo, 4,390,501, Cl. 422-143.000.
Dlugos, Daniel F., to Pitney Bowes Inc. Mailing system with sequential printing control. 4,390,952, Cl. 364-464.000.
Dobrynin, Vladimir E.: *See*—
Garkusha, Anatoly V.; and Dobrynin, Vladimir E., 4,390,319, Cl. 415-209.000.
Dockal, Ronald J.: *See*—
Horky, Joseph F.; and Dockal, Ronald J., 4,390,964, Cl. 364-900.000.
Dr. Beck & Co. AG: *See*—
Janssen, Harald; and Hansch, Ferdinand, 4,390,686, Cl. 528-289.000.
Dr. Carl Hahn, G.m.b.H.: *See*—
Stuttgen, Gunter; and Schaefer, Hans, 4,390,532, Cl. 424-240.000.
Doi, Kazuyuki: *See*—
Higashiyama, Naotoshi; and Doi, Kazuyuki, 4,390,746, Cl. 179-1.0GE.
Dolman, John E.: *See*—
Tatters, Ronald; Dolman, John E.; and Howell, Donald R., deceased, 4,389,922, Cl. 92-156.000.
Dominion Engineering Works, Ltd.: *See*—
Davies, Kenneth W., 4,389,865, Cl. 72-29.000.

Donaldson, Robert D., to Bendix Corporation, The. Pneumatic counterbalance for a coordinate measuring machine. 4,389,781, Cl. 33-1.00M.

Donovan, William J., deceased; by Coppola, A. Gerard, executor; and Sanford, William D. High pressure laminate for access floor panels. 4,390,580, Cl. 428-68.000.

Dow Chemical Company, The: *See—*
Clarke, Donald H.; Pomranky, George J.; and Schmidt, Donald L., 4,390,644, Cl. 521-121.000.
Green, John G., 4,390,692, Cl. 536-84.000.
Hoffman, Dwight K.; Harris, Robert F.; Tefertiller, Nancy B.; and Rains, Randall C., 4,390,645, Cl. 521-137.000.
Manzie, Otter L., Jr., 4,389,878, Cl. 73-38.000.
Nelson, Donald L., 4,390,680, Cl. 528-97.000.
Stanley, Frederick W., Jr.; and Fairchok, William J., 4,390,659, Cl. 524-555.000.

Downing, Terry R.; Zorns, John M.; and Croft, Winfred C., to Allis-Chalmers Corporation. Automatic mechanical brake adjuster. 4,390,085, Cl. 188-72.900.

Dracka, Oldrich: *See—*
Mackrle, Svatopluk; Mackrle, Vladimir; and Dracka, Oldrich, 4,390,422, Cl. 210-188.000.

Dragun, Edward B.: *See—*
Trembly, Gray C.; Goldberg, Ernest; and Dragun, Edward B., 4,389,940, Cl. 102-489.000.

Draiswerke GmbH: *See—*
Durr, Herbert; Christen, Werner; and Muller, Helmut, 4,390,285, Cl. 366-168.000.

Dreier, Ernst; and Hoss, Richard, to Fritz Gegauf Aktiengesellschaft Bernina-Machmaschinenfabrik. Needle bar operated trimmer. 4,389,952, Cl. 112-128.00R.

Drouin, Gilbert; Lacoste, Jean; and Tremblay, Gilles. Screw extractor. 4,389,913, Cl. 81-53.200.

Drury, Michael J.: *See—*
Woodside, Robert H.; and Drury, Michael J., 4,390,874, Cl. 340-812.000.

Drying Systems, Inc.: *See—*
Chard, James W., Jr.; and Corrigan, Timothy F., 4,390,093, Cl. 198-654.000.

Du Pont Canada Inc.: *See—*
Oughton, Richard W., 4,390,469, Cl. 260-123.500.

Dubois, Michel A. J., to Esso Societe Anonyme Francaise. Apparatus suitable for use in closing openings with a foam-expanded bladder. 4,390,333, Cl. 425-11.000.

Dudek, Harold M., to Astro Development Corporation. Partially fluid locked drive train. 4,389,908, Cl. 74-711.000.

Dudley, Kenneth W.: *See—*
Teich, Wesley W.; and Dudley, Kenneth W., 4,390,768, Cl. 219-10.55B.

Dufour, Joseph H., Sr. Semiautomatic firearm. 4,389,920, Cl. 89-190.000.

Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Apparatus and method for rearing shrimp. 4,389,974, Cl. 119-2.000.

Dugan, Timothy: *See—*
Dugan, Charles; and Dugan, Timothy, 4,389,974, Cl. 119-2.000.

Duley, Walter W.: *See—*
Steen, William M.; and Duley, Walter W., 4,390,774, Cl. 219-121.0FS.

Dull, Hans-Jurgen; and Hillmer, Adolf, to Siemens Aktiengesellschaft. Switch for a carriage of a two track suspension railroad. 4,389,942, Cl. 104-103.000.

Dulux Australia Limited: *See—*
Graetz, Clive W.; Thompson, Morice W.; and Bromley, Charles, 4,390,658, Cl. 524-512.000.

Dumont Industries: *See—*
Marcotte, Richard P.; and Dumont, John W., Jr., 4,389,980, Cl. 122-114.000.

Dumont, John W., Jr.: *See—*
Marcotte, Richard P.; and Dumont, John W., Jr., 4,389,980, Cl. 122-114.000.

Duncan, Jeffrey B., to Albany International Corp. Dewatering system with water deckle. 4,390,433, Cl. 210-767.000.

Duncan, Ronnie J. Snap-on shut off valve. 4,390,159, Cl. 251-148.000.

Dunlap, Alvin E. Drill guide. 4,389,790, Cl. 33-185.00R.

Dunn, Larry P.: *See—*
Chow, William W.; and Dunn, Larry P., 4,390,916, Cl. 360-127.000.

Dunn, Sidney R., to Photax (London) Ltd. Slide viewer or projector. 4,389,803, Cl. 40-361.000.

Dunn, Wendell E., Jr., to Reynolds Metals Company. Aluminum chloride addition to electrolytic cells. 4,390,400, Cl. 204-67.000.

Duplessis, Philippe; and Delpit, Philippe, to Compagnie Industrielle Des Telecommunications Cit-Alcatel. Digital frequency sender. 4,390,983, Cl. 370-77.000.

Du Pont de Nemours, E. I., and Company: *See—*
Anderson, Jerrel C., 4,390,655, Cl. 524-413.000.
Faulhaber, Mark E.; and Prober, James M., 4,390,785, Cl. 250-330.000.
Ginn, David W., 4,390,825, Cl. 318-384.000.
Resnick, Paul R., 4,390,720, Cl. 560-184.000.

Dupray, Dominique: *See—*
Fourcade, Pierre; and Dupray, Dominique, 4,390,985, Cl. 370-94.000.

Duracell Inc.: *See—*
Barnette, Luverne H.; and Liang, Charles C., 4,390,446, Cl. 252-182.100.

Durr, Herbert; Christen, Werner; and Muller, Helmut, to Draiswerke GmbH. Method and apparatus for mixing solids with liquids, in particular for gluing wood chips. 4,390,285, Cl. 366-168.000.

Dustin, Paul C.: *See—*
Spigarelli, Donald J.; and Dustin, Paul C., 4,389,797, Cl. 34-73.000.

Dutmers, Louis G.: *See—*
Hutson, Marvin R.; and Dutmers, Louis G., 4,390,132, Cl. 241-55.000.

Dvoracek, Louis M.; Fischer, Paul W.; and Skripek, Milan, to Union Oil Company of California. Process and compositions for reducing fouling of heat exchange surfaces. 4,390,412, Cl. 208-48.00R.

Dwojak, Stanislaw: *See—*
Kolodziejski, Stanislaw; Dwojak, Stanislaw; and Grabowski, Andrzej, 4,389,897, Cl. 73-861.000.

Dynatrans AB: *See—*
Oberg, Lars G., 4,390,314, Cl. 414-547.000.

E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Wade, Peter C., 4,390,695, Cl. 544-130.000.
Ridgway, Frank; and Woolfenden, Richard D. G., 4,390,558, Cl. 426-541.000.

E-Z-Rect Metal Products Ltd.: *See—*
Husband, Wallace T., 4,390,103, Cl. 211-182.000.

Eapen, Kuttikandathil E.: *See—*
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,390,550, Cl. 426-102.000.

Eastman Kodak Company: *See—*
Cooper, James L., 4,390,473, Cl. 260-429.00R.
Gabrielsen, Rolf S.; Graham, Patricia A.; Klijanowicz, James E.; and Stern, Max H., 4,390,606, Cl. 430-9.000.
Minor, James C., 4,390,267, Cl. 355-14.00E.

Eaton Corporation: *See—*
Goscenski, Edward J., Jr., 4,389,909, Cl. 74-711.000.
Thorson, Clayton W., 4,390,329, Cl. 418-61.00B.

Eberli, Heiner: *See—*
Briner, Emil; Clement, Heinz; and Eberli, Heiner, 4,389,752, Cl. 19-0.560.

Ebneth, Harold; and Klipfel, Siegfried, to Bayer Aktiengesellschaft. Process for coating cloth of metallized textile fibers and their use for the production of microwave-reflecting articles. 4,390,588, Cl. 428-263.000.

Eddy, Albert R.: *See—*
Kast, Jack L.; Eddy, Albert R.; and Carter, Merle F., 4,389,919, Cl. 89-185.000.

Edgerton, Robert F., to Energy Conversion Devices, Inc. Apparatus for regulating substrate temperature in a continuous plasma deposition process. 4,389,970, Cl. 118-666.000.

Edgren, Richard A., to Syntex Pharmaceuticals International Ltd. Method of contraception using peak progestogen dosage. 4,390,531, Cl. 424-239.000.

Edsyn, Inc.: *See—*
Dallons, Robert E.; and Fortune, William S., 4,389,912, Cl. 81-43.000.

Edwards, Julian D.: *See—*
Lea, Richard K.; Edwards, Julian D.; and Colton, D. Frederick, 4,390,366, Cl. 75-101.0BE.

Eglowstein, Ira; and Solender, Peter E., to Interface Systems, Inc. Interface system wherein the interface is addressed before data transfer from a selected device. 4,390,967, Cl. 364-900.000.

Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, to Merck Patent Gesellschaft mit beschrankter Haftung. Mixtures of aromatic-aliphatic ketones as photoinitiators and photopolymerizable systems containing them. 4,390,453, Cl. 252-426.000.

Eisworth, James E., to General Electric Company. Tip cap for a rotor blade and method of replacement. 4,390,320, Cl. 416-97.00R.

Elastic Coating Systems, Inc.: *See—*
Rehberg, Irene L., 4,390,570, Cl. 427-385.500.

Elkateb, Makeen M.; and Cheetham, William J., to General Electric Company Limited, The. Fault identification in electric power transmission systems. 4,390,835, Cl. 324-51.000.

Elks, William J. Proximity indicator for motor vehicles. 4,390,862, Cl. 340-61.000.

Ellefsen, George E.: *See—*
Seibert, Lloyd; and Ellefsen, George E., 4,389,804, Cl. 40-447.000.

Ellicson, John W.: *See—*
Pickens, Robert C., Jr.; Thomas, Reese R.; and Ellicson, John W., 4,390,582, Cl. 428-85.000.

Elliston, Thomas L., to Hydra Rig Incorporated. Fire fighting boom assembly for service vessel. 4,390,315, Cl. 414-740.000.

Elo, Ari; and Poikonen, Jorma, to Elomatic Oy. Pump driven by the radiation energy of the sun. 4,390,325, Cl. 417-379.000.

Elomatic Oy: *See—*
Elo, Ari; and Poikonen, Jorma, 4,390,325, Cl. 417-379.000.

Embach, James T. Viewer/projector for display of 360 degree holographic film cassettes. 4,390,234, Cl. 350-3.650.

Endo, Hirofumi: *See—*
Yamato, Takashi; Endo, Hirofumi; Matsumoto, Kiniichiro; and Miyake, Hajimu, 4,390,548, Cl. 424-321.000.

Enen, Jack, Jr.; and Sullivan, Wayne M., to Enen Machine Tool & Equipment Co. Junk basket. 4,390,064, Cl. 166-99.000.

Enen Machine Tool & Equipment Co.: *See—*
Enen, Jack, Jr.; and Sullivan, Wayne M., 4,390,064, Cl. 166-99.000.

Energy Conversion Devices, Inc.: *See—*
Edgerton, Robert F., 4,389,970, Cl. 118-666.000.

Energy Profiles, Inc.: *See—*
Salisbury, Winfield W., 4,390,494, Cl. 376-107.000.
Salisbury, Winfield W., 4,390,495, Cl. 376-120.000.

Enga, Bernard E.; and Prasad, Christopher, to Johnson, Matthey & Co., Limited. Prechamber catalytic ignition system. 4,389,983, Cl. 123-143.00B.

Engineering & Research Associates, Inc.: *See*—
Rosen, Evan W., 4,390,073, Cl. 177-118.000.
Taylor, Junius E., 4,390,832, Cl. 323-273.000.

English, Irene F.: *See*—
English, Roy L.; and English, Irene F., 4,389,815, Cl. 47-81.000.

English, Roy L.; and English, Irene F. Wick support for wick-watering plants. 4,389,815, Cl. 47-81.000.

Engstrom, Keith A., to Illinois Tool Works Inc. Keyboard with electronic hysteresis. 4,390,866, Cl. 340-365.00E.

Enomoto, Kanehiko: *See*—
Watanabe, Ichiro; Enomoto, Kanehiko; and Ogawa, Yasuo, 4,390,631, Cl. 435-244.000.

Enomoto, Ryo; Yoshioka, Michihiro; and Yokoyama, Takao, to Ibigawa Electric Industry Co. Ltd. Apparatus for producing silicon carbide consisting mainly of β-type crystal. 4,390,504, Cl. 422-166.000.

Epstein, Irving. Releasable hook. 4,389,907, Cl. 74-529.000.

Erdman, David M.; and Harms, Harold B., to General Electric Company. Laundering apparatus, method of operating a laundry machine, control system for an electronically commutated motor, method of operating an electronically commutated motor, and circuit. 4,390,826, Cl. 318-439.000.

Erickson, Roger D.: *See*—
Chynoweth, William R.; and Erickson, Roger D., 4,390,887, Cl. 346-155.000.

Eriksen, Carl-Erik: *See*—
Grove, Morgens W.; and Eriksen, Carl-Erik, 4,390,056, Cl. 164-7.100.

Ericsson, Alf, to Aktiebolaget Svenska Precisions verktyg. Tapping attachment. 4,390,310, Cl. 408-141.000.

Ernest, Michael V.: *See*—
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,390,456, Cl. 252-448.000.

Erno-Raumfahrttechnik GmbH: *See*—
Schilf, Lothar; and Giese, Ingo H., 4,390,275, Cl. 356-43.000.

Ernsberger, Fred M., to PPG Industries, Inc. Low temperature reduction process for photomasks. 4,390,592, Cl. 428-410.000.

Ernst, Gunter; and Wurz, Dieter, to Aktiebolag Carl Munters. Apparatus for spraying trickler plates with cooling water. 4,390,481, Cl. 261-112.000.

Esakov, Michael D.: *See*—
Ferguson, Daniel J.; Stringer, Frederick D.; and Esakov, Michael D., 4,390,385, Cl. 156-229.000.

Esho, Sotaro; and Gokan, Hiroshi, to Nippon Electric Co., Ltd. Process for manufacture of thin-film magnetic bubble domain detection device. 4,390,404, Cl. 204-192.00E.

Esmil B.V.: *See*—
van Leeuwen, Johannes, 4,390,430, Cl. 210-527.000.

Esselte Pendaflex Corporation: *See*—
Holland-Letz, Gunter, 4,389,934, Cl. 101-92.000.

Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard. Contact electrode for melting and heating furnaces with DC plasma heating. 4,390,773, Cl. 219-121.0PR.

Essex Group, Inc.: *See*—
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,390,590, Cl. 428-383.000.

Esso Societe Anonyme Francaise: *See*—
Dubois, Michel A. J., 4,390,333, Cl. 425-11.000.

Ethyl Corporation: *See*—
Leavitt, Richard I., 4,390,624, Cl. 435-107.000.

Ethyl Development Corporation: *See*—
Bowers, Kenneth E.; and Markley, Charles E., 4,390,338, Cl. 425-525.000.

Evans, Daniel R. Adjustable surgical arm rest and instrument platform. 4,390,011, Cl. 128-1.00R.

Evans, William P.; and Leger, Violeta Z., to Union Carbide Corporation. Complex metal sulfide cathodes for nonaqueous cells. 4,390,604, Cl. 429-197.000.

Ex-Cell-O Corporation: *See*—
Hendry, James W.; and Han, Je-Chin, 4,390,486, Cl. 264-45.500.
Lisiecki, Robert E., 4,390,121, Cl. 229-17.00G.

Exxon Production Research Co.: *See*—
Willman, Bertram T., 4,390,067, Cl. 166-245.000.

Exxon Research and Engineering Co.: *See*—
Chianelli, Russell R.; and Pecoraro, Theresa A., 4,390,514, Cl. 423-509.000.
Cody, Ian A., 4,390,414, Cl. 208-111.000.
Davis, Thomas A.; and Asher, William J., 4,390,521, Cl. 424-36.000.
Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 4,390,369, Cl. 106-31.000.
Michaelson, Robert C.; and Austin, Richard G., 4,390,739, Cl. 568-860.000.
Oswald, Alexis A., 4,390,729, Cl. 568-454.000.

Eynck, John J., to United States of America, Navy. Acoustic signal conditioning device. 4,390,976, Cl. 367-153.000.

Fagan, Michael W. Ladder rack for vehicle. 4,390,117, Cl. 224-310.000.

Fahmy, Mohamed A., to Rhone-Poulenc Agrochimie. S-(Tertiary alkyl) alkylphosphonoamidodithioates and their use as insecticides and nematocides. 4,390,529, Cl. 424-220.000.

Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., to Steelcase, Incorporated. Synchrotilt chair control. 4,390,206, Cl. 297-300.000.

Fairchild Camera & Instrument Corp.: *See*—
Kurtz, John A.; and Cousens, Donald E., 4,390,771, Cl. 219-56.220.
Phy, William S., 4,390,598, Cl. 428-577.000.

Fairchok, William J.: *See*—
Stanley, Frederick W., Jr.; and Fairchok, William J., 4,390,659, Cl. 524-555.000.

Fandrey, Peter: *See*—
Lehmann, Wilfried; and Fandrey, Peter, 4,390,317, Cl. 415-143.000.

Fangmann, Michael D., to Jancy Engineering Co. Cradle pipe adaptor for magnetic drill. 4,390,309, Cl. 408-76.000.

Farm Fresh Shrimp Corporation: *See*—
Dugan, Charles; and Dugan, Timothy, 4,389,974, Cl. 119-2.000.

Farooq, Saleem: *See*—
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,390,538, Cl. 424-249.000.

Faulhaber, Mark E.; and Prober, James M., to Du Pont de Nemours, E. I., and Company. Method and apparatus for remotely detecting gases in the atmosphere. 4,390,785, Cl. 250-330.000.

Fehr, Richard B. Toolbag suspenders and holder. 4,390,116, Cl. 224-209.000.

Fekete, Gyorgy: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.

Fell, Wolfgang; and Sanders, Werner, to Robert Bosch GmbH. Tape cassette and cassette receiver combination for transducing apparatus. 4,390,913, Cl. 360-85.000.

Fenley, Joel S., to Saf-T-Trac Company. Drapery carrier. 4,390,055, Cl. 160-348.000.

Ferguson, Daniel J.; Stringer, Frederick D.; and Esakov, Michael D., to W. R. Grace & Co., Cryovac Div. Heat sealable, multi-ply polypropylene film. 4,390,385, Cl. 156-229.000.

Ferguson, Edward J., to Gillette Company, The. Erasable inks containing thermoplastic block copolymers. 4,390,646, Cl. 523-161.000.

Fernekes, Robert W.; and Tesser, Murray V., to Senscom Corporation. Hand held viewer for various size films. 4,390,257, Cl. 353-95.000.

Ferro Corporation: *See*—
Votava, Werner F., 4,390,636, Cl. 501-24.000.

Feurer, Bernard, to Alcon Pharmaceuticals Limited. Method for molding contact lenses using microwave energy. 4,390,482, Cl. 264-1.400.

Fiber Industries, Inc.: *See*—
McLaughlin, William D., Jr., 4,389,774, Cl. 30-133.000.

Fiberglas Canada Limited: *See*—
Coker, Robert J.; Bate, Gary W.; and Deuzeman, Henk J., 4,390,398, Cl. 203-18.000.

Fickelscher, Kurt G., to P. A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. Machine with rotary piston including a flexible annular member. 4,390,328, Cl. 418-45.000.

Findeis, Gunter: *See*—
Biedermann, Ernst; Findeis, Gunter; Weber, Klaus; and Zahn, Wolfgang, 4,390,270, Cl. 355-46.000.

Finike Italiana Marposs S.p.A.: *See*—
Solaroli, Sergio, 4,389,787, Cl. 33-174.00Q.

Fink, Warren R.: *See*—
Tafara, Peter T.; and Fink, Warren R., 4,390,425, Cl. 210-232.000.

Firestone Tire & Rubber Company, The: *See*—
Lee, Kang I.; and Oziomek, James, 4,390,673, Cl. 526-212.000.

Fischbach, Wolfgang, to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik. Side handle for utensils. 4,390,200, Cl. 294-27.00H.

Fischer, Artur. Connecting element. 4,389,809, Cl. 46-26.000.

Fischer, Paul W.: *See*—
Dvoracek, Louis M.; Fischer, Paul W.; and Skripek, Milan, 4,390,412, Cl. 208-48.00R.

Fischer, Wolfgang; and Link, Renate, to Merck Patent Gesellschaft mit beschrankter Haftung. Method for the determination of leukemic cells. 4,390,518, Cl. 424-3.000.

Fisher, Christopher L., to Armco Inc. Composite arch structure. 4,390,306, Cl. 405-124.000.

Fisher, James B., Jr. Dual purpose bird feeder. 4,389,975, Cl. 119-51.00R.

Fitzhugh, Raymond L.: *See*—
Balogh, Louis J.; Fitzhugh, Raymond L.; Kimes, Dale S.; and Weinstein, Myron, 4,389,788, Cl. 33-178.00D.

Flander, Walter; Leikas, Jukka; and Hirvonen, Vesa, to Oy Wartsila Oy. Method for the production and assembly of lock parts. 4,389,764, Cl. 29-416.000.

Fleishman, Gregg. Portable furniture. 4,390,204, Cl. 297-16.000.

Fleming, Dennis J.: *See*—
Flowerday, Carl; Marcus, Konrad H.; Kempkers, Gordon; Boerema, Edward T.; and Fleming, Dennis J., 4,390,202, Cl. 296-97.00K.

Fletcher, Edwin H., to Transway International Corporation. Barge. 4,389,960, Cl. 114-248.000.

Flowerday, Carl; Marcus, Konrad H.; Kempkers, Gordon; Boerema, Edward T.; and Fleming, Dennis J., to Prince Corporation. Visor control. 4,390,202, Cl. 296-97.00K.

Fonda, James B., to Lord Corporation. Photocurable compositions for use as ceramic ink vehicles. 4,390,565, Cl. 427-44.000.

Fong, Calvin C.; Altizer, John W.; Arnold, Vernon E.; and Lawson, John K., to Lockheed Corporation. Blasting machine utilizing sublimable particles. 4,389,820, Cl. 51-410.000.

Ford Motor Company: *See*—
Butler, James W.; and Colvin, Alex D., 4,389,881, Cl. 73-116.000.
Schechter, Michael M., 4,390,856, Cl. 335-256.000.

Forestier, Serge: *See*—
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,390,522, Cl. 424-45.000.
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,390,689, Cl. 528-335.000.
Forman, Everett W. Self-retaining rib belt. 4,390,014, Cl. 128-78.000.
Forster, Hans: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,390,029, Cl. 131-109.0AB.
Fortune, William S.: *See*—
Dallons, Robert E.; and Fortune, William S., 4,389,912, Cl. 81-43.000.
Foster, Edwin E. Adjustable bicycle handlebar stem. 4,390,300, Cl. 403-24.000.
Fourcade, Pierre; and Dupray, Dominique, to Thomson-CSF. Device for the synchronization of digital data transmitted in packets. 4,390,985, Cl. 370-94.000.
Fournier, Jacques M. A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". System for measuring resonance frequencies in turbine and compresor vanes and propeller blades. 4,389,891, Cl. 73-579.000.
Fowler, Alan B.; Rosenberg, Robert; and Rupprecht, Hans S., to International Business Machines Corporation. Self-aligned process for fabricating gallium arsenide metal-semiconductor field effect transistors. 4,389,768, Cl. 29-571.000.
Fox, Ronald L., to United States of America, Energy. Downhole steam generator using low pressure fuel and air supply. 4,390,062, Cl. 166-59.000.
Foxcroft Associates: *See*—
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., 4,389,737, Cl. 3-1.700.
Frabricius, Hans-Ake; and Stahn, Roland, to Hooper Trading Company. Serum-free and mitogen-free T-cell growth factor and process for making same. 4,390,623, Cl. 435-68.000.
Framatome: *See*—
Bes, Louis, 4,390,034, Cl. 134-104.000.
Frankle, Gerhard; and Hase, Friedrich-Wilhelm, to Daimler-Benz Aktiengesellschaft. Control member for fuel injection devices. 4,389,987, Cl. 123-300.000.
Franz, Norman J.; and Reynolds, Elizabeth B., to Buckeye Cellulose Corporation, The. Impervious oversleeve with antiroll-down collar for surgical gown. 4,389,734, Cl. 2-59.000.
Fraser, William A.: *See*—
Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils, 4,390,677, Cl. 526-348.600.
Frei AG Maschinenbau: *See*—
Frei, Siegfried, 4,389,964, Cl. 118-66.000.
Frei, Siegfried, to Frei AG Maschinenbau. Apparatus for applying a protective coating to the seam of welded can sleeves. 4,389,964, Cl. 118-66.000.
Freitag, Hans-Albrecht: *See*—
Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, 4,390,640, Cl. 521-51.000.
Fremont Industries, Inc.: *See*—
Spekman, Paul, Jr., 4,390,465, Cl. 252-527.000.
Freud, Paul J., to Leeds & Northrup Company. Multiple-cavity variable capacitance pressure transducer. 4,390,925, Cl. 361-283.000.
Freyre, Frederick W., to Hazeltine Corporation. Continuously variable delay line. 4,390,247, Cl. 350-358.000.
Friberg, Ulf R.: *See*—
Andreason, Gustav O.; Friberg, Ulf R.; Kuvaja, Heimo H.; and Qvarnstrom, Bengt G. L., 4,389,814, Cl. 47-73.000.
Friedmann, Oswald: *See*—
Huber, Lothar; and Friedmann, Oswald, 4,389,985, Cl. 123-198.00F.
Frielingsdorf, Horst. Method and apparatus for the transport of glass panes. 4,390,358, Cl. 65-111.000.
Friis, Nils: *See*—
Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils, 4,390,677, Cl. 526-348.600.
Fritz Fuss Kom.-Ges Elektrotechnische Fabrik: *See*—
Merkel, Willi, 4,390,863, Cl. 340-310.00R.
Fritz Gegauf Aktiengesellschaft Bernina-Machmaschinenfabrik: *See*—
Dreier, Ernst; and Hoss, Richard, 4,389,952, Cl. 112-128.00R.
Frollini, Dominick, Jr.: *See*—
Kato, Kenneth J.; and Frollini, Dominick, Jr., 4,390,406, Cl. 204-435.000.
Fry, Donovan N.: *See*—
Sharrock, Michael; Fry, Donovan N.; and William, Robert, 4,389,801, Cl. 40-159.000.
Fryer, Rodney L: *See*—
Walser, Armin; and Fryer, Rodney L, 4,390,471, Cl. 260-244.400.
Frymire, Roger: *See*—
Hennessy, Richard E.; Frymire, Roger; and Coovert, Cary, 4,390,968, Cl. 364-900.000.
Fuchs, Heinz, to Ruhrkohle A G. Drill core inclinometer. 4,389,792, Cl. 33-304.000.
Fuji Photo Film Co., Ltd.: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, 4,390,618, Cl. 430-543.000.
Mori, Teruo; Shirai, Hiroshi; Kakei, Tsutomu; Watanabe, Masaru; and Matsuhisa, Tsuneyasu, 4,390,407, Cl. 204-206.000.
Ohara, Yuji; and Horikawa, Kazuo, 4,390,882, Cl. 346-1.100.
Ono, Yoshihiro; Nahara, Akira; and Ikeda, Tomoaki, 4,390,601, Cl. 428-412.000.
Sato, Kozo; Iwakura, Ken; and Igarashi, Akira, 4,390,616, Cl. 430-338.000.
Fujikawa, Tadashi; and Goto, Masami, to Nissan Motor Company, Limited. Head lamp washing system. 4,390,128, Cl. 239-284.00A.
Fujiki, Yoshinori, to National Institute for Researches in Inorganic Materials. Process for manufacturing fibrous potassium titanate. 4 390,513, Cl. 423-598.000.
Fujimoto, Misao, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation system for internal combustion engines. 4,390,001, Cl. 123-571.000.
Fujimura, Motoki: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; and Fujimura, Motoki, 4,390,626, Cl. 435-176.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ohnishi, Norio; and Ibuki, Rinta, 4,390,694, Cl. 544-22.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,390,534, Cl. 424-246.000.
Fujita, Kazunori: *See*—
Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, 4,390,603, Cl. 429-30.000.
Fujita, Yoshiji: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshio; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.
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Kurafuji, Setsuo, 4,390,798, Cl. 307-296.00R.
Shimoda, Haruo; and Tanabe, Kaoru, 4,389,967, Cl. 118-500.000.
Fujiwara, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic recording system. 4,390,907, Cl. 360-32.000.
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Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, heir, 4,390,608, Cl. 430-57.000.
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Fulkerson, Earl. Apparatus having push/pull actuated boom for generating waves in the ground. 4,390,077, Cl. 181-121.000.
Furuichi, Masayoshi; Honjo, Takeshi; and Akiba, Nobuo, to Copyer Co., Ltd.; and Canon Inc. Clearing device for transferring system wet type copying machine. 4,390,268, Cl. 355-15.000.
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Okano, Michiaki; and Furuichi, Shuhei, 4,390,028, Cl. 128-777.000.
Furukawa, Hidenori: *See*—
Nishikawa, Masahiko; Ishibashi, Hiroaki; and Furukawa, Hidenori, 4,390,691, Cl. 536-65.000.
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G. A. Serlachius Oy: *See*—
Larikka, Leo, 4,389,866, Cl. 72-71.000.
Gabrielsen, Rolf S.; Graham, Patricia A.; Klijanowicz, James E.; and Stern, Max H., to Eastman Kodak Company. Color-forming para-sulfonamidodiphenylamine dye precursor and sulfonimide dye in photographic material and process. 4,390,606, Cl. 430-9.000.
Gaertner, Gregory E.: *See*—
Wu, Ta-Ming; and Gaertner, Gregory E., 4,390,780, Cl. 377-44.000.
GAF Corporation: *See*—
Ziegler, B. Randall, 4,390,336, Cl. 425-82.100.
Gaillard, Jean: *See*—
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., 4,390,431, Cl. 210-724.000.
Gaitos, Janise N.; Shattuck, Meredith D.; and Wilbur, Clayton V., to International Business Machines Corporation. Method and apparatus for correction of non-impact printing. 4,390,297, Cl. 400-697.100.
Galera, Richard: *See*—
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Galli, Paolo: *See*—
Cuffiani, Illaro; Galli, Paolo; and Zucchini, Umberto, 4,390,454, Cl. 252-429.00B.
Gambro AG: *See*—
Riede, Gerhard, 4,390,424, Cl. 210-232.000.
Gaussen, Alexander; Oppelt, Arnulf; and Loeffler, Wilfried, to Siemens Aktiengesellschaft. Zeugmatography process. 4,390,840, Cl. 324-309.000.
Gardner, Joseph J., Jr. Jam prevention means for high-speed web handling device. 4,390,118, Cl. 226-25.000.
Garkusha, Anatoly V.; and Dobrynin, Vladimir E. Turbine exhaust hood. 4,390,319, Cl. 415-209.000.
Garner, Harold: *See*—
Rudell, Elliot; Cernansky, Joseph; and Garner, Harold, 4,390,178, Cl. 272-114.000.
Garrett, Robert A.: *See*—
Wier, John P.; and Garrett, Robert A., 4,390,076, Cl. 180-11.000.
Garrison, Harold K.; and Ratzlaff, Howard J., to Hesston Corporation. Anti-slip bale thrower. 4,390,092, Cl. 198-638.000.
Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corporation. Solids feeding device and system. 4,390,502, Cl. 422-145.000.

Garver, Edward B., Sr., to Baxter Travenol Laboratories, Inc. Autoclavable thermoplastic material which is heat bondable to a cannula and the like. 4,390,668, Cl. 525-444.000.

Garvey, Steven E. Electronically variable resistance device. 4,390,860, Cl. 338-38.000.

Garwin, Richard L., to International Business Machines Corporation. Security of manufactured apparatus. 4,390,868, Cl. 340-568.000.

Gasser, Hermann: *See*—
Briner, Emil; Novak, Peter; Tanner, Bruno; and Gasser, Hermann, 4,389,840, Cl. 57-267.000.

Gasser, Max G.: *See*—
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Gately, Dana R., to Sealed Air Corporation. Apparatus having an automatic foam dispensing system for forming shock-absorbing members in a container. 4,390,337, Cl. 425-89.000.

Gates, James T. Humidifying system for mobile vehicles. 4,390,479, Cl. 261-27.000.

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Gebrueder Buehler AG: *See*—
Kossebau, Friedrich K. O., 4,390,090, Cl. 193-32.000.

Gedon, Catherine. Small-size device for simulating a bridge game. 4,390,183, Cl. 273-148.00A.

Geiler, Volkmar: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,390,638, Cl. 501-77.000.

Geisow, Bernard H., to Daniel Industries, Inc. Compression spring capsule. 4,390,171, Cl. 267-169.000.

General Electric Company: *See*—
Ashby, Bruce A., 4,390,660, Cl. 524-721.000.
Axelrod, Robert J., 4,390,477, Cl. 260-927.00R.
Brazel, James P., 4,390,583, Cl. 428-113.000.
Brown, Edgar D., Jr., 4,390,651, Cl. 524-267.000.
Eiswerth, James E., 4,390,320, Cl. 416-97.00R.
Erdman, David M.; and Harms, Harold B., 4,390,826, Cl. 318-439.000.
Ghezzo, Mario; and Griffing, Bruce F., 4,390,393, Cl. 156-643.000.
Giles, Harold F., Jr., 4,390,665, Cl. 525-180.000.
Houston, John M., 4,390,839, Cl. 324-116.000.
Liu, Ping Y., 4,390,657, Cl. 524-504.000.
Michael, Richard N., 4,390,870, Cl. 340-648.000.
O'Brien, Kirk G.; and DeBrita, John A., 4,390,806, Cl. 310-261.000.
Ritzer, Alan; Shah, Bakulesh; and Sliva, Daniel E., 4,390,510, Cl. 423-342.000.
Rosenbaum, Herman S.; and Davies, John H., 4,390,497, Cl. 376-414.000.
Steigerwald, Robert L., 4,390,769, Cl. 219-10.770.
Wanat, David J., 4,390,133, Cl. 241-93.000.

General Electric Company Limited, The: *See*—
Elkateb, Makeen M.; and Cheetham, William J., 4,390,835, Cl. 324-51.000.

General Foods Corporation: *See*—
Swartley, John S.; and Der Avedisian, Suren, 4,390,551, Cl. 426-107.000.

General Mills Products Corp.: *See*—
Trautlein, Fred S.; and Stephens, James R., 4,390,099, Cl. 211-4.000.

General Motors Corporation: *See*—
Hammond, Dean C., Jr.; and Vickers, Paul T., 4,390,355, Cl. 55-523.000.
Lockhart, Bruce D., 4,389,910, Cl. 74-843.000.
Plyler, Robert G.; and Suverison, Lyle B., 4,390,231, Cl. 339-217.00S.
Strahan, Robert M.; Hopf, Philip W.; and Williams, Phillip G., 4,390,193, Cl. 280-777.000.
Widr [illegible], Paul; and Mercer, Robert R., 4,390,208, Cl. 297-379.000.

Genvex Energiteknik A/S: *See*—
Svendsen, Biarne R., 4,389,857, Cl. 62-325.000.

George F. and Irene Sherrill 1978 Trust No. 1: *See*—
Sherrill, George F., 4,390,539, Cl. 424-251.000.

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Sherrill, George F., 4,390 539, Cl. 424-251.000.

Gerberich, H. Robert, to Celanese Corporation. Formaldehyde production. 4,390,730, Cl. 568-473.000.

Getz, John L., to Industrial Adhesive, Inc. Apparatus for applying hot-melt to thread. 4,389.966, Cl. 118-405.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; Lagodka, Gunter; and Pohlmann, Klaus-Dieter, 4,390,308, Cl. 405-299.000.

Geyling, Franz T.; and Louzon, Theodore J., to Bell Telephone Laboratories, Incorporated. Metal coating of fibers. 4,390,589, Cl. 428-381.000.

Ghezzo, Mario; and Griffing, Bruce F., to General Electric Company. Method of forming an isolation trench in a semiconductor substrate. 4,390,393, Cl. 156-643.000.

Giaimo, Anthony: *See*—
Larsen, Robert H.; and Giaimo, Anthony, 4,389,955, Cl. 112-184.000.

Gibson, Dennis H., to Caterpillar Tractor Co. Rotation sensitive pressure regulator. 4,389,991, Cl. 123-383.000.

Gibson, Paul W.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Proteinaceous foaming compositions and method for preparing foamed proteinaceous products. 4,390,450, Cl. 252-307.000.

Giese, Ingo H.: *See*—
Schilf, Lothar; and Giese, Ingo H., 4,390,275, Cl. 356-43.000.

Giese, Wolfgang. Magnetic tape handling apparatus. 4,390,145, Cl. 242-186.000.

Giles, Harold F., Jr., to General Electric Company. Polyetherimide-EPDM terpolymer blends. 4,390,665, Cl. 525-180.000.

Gillette Company, The: *See*—
Ferguson, Edward J., 4,390,646, Cl. 523-161.000.
Nissen, Warren I.; and Petrillo, Richard J., 4,389,773, Cl. 30-50.000.
Strout, Robert B., 4,389,868, Cl. 72-132.000.

Ginn, David W., to Du Pont de Nemours, E. I., and Company. Autothreshold slow start control circuit for a centrifuge. 4,390,825, Cl. 318-384.000.

Girgis, Mikhail M., to PPG Industries, Inc. Non-starch containing aqueous sizing composition for glass fibers and sized glass fibers for use in reinforcing elastomers. 4,390,647, Cl. 523-212.000.

Givaudan Corporation: *See*—
Krasnobajew, Victor, 4,390,556, Cl. 426-538.000.
Krasnobajew, Victor, 4,390,557, Cl. 426-538.000.

Gliemeroth, Georg: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,390,638, Cl. 501-77.000.

Globe Oil Tools, Inc.: *See*—
Phelan, Charles M., 4,390,072, Cl. 175-229.000.

Gloystein, Jurgen F. G.; and Szirniks, Klaus G., to Conver Ingenieur-Technik GmbH & Co. KG. Container coupling with split housing. 4,389,761, Cl. 24-287.000.

Glyco-Metall-Werke Daelen & Loos GmbH: *See*—
Hodes, Erich; Sternisa, Danilo; and Schneider, Walter, 4,390,563, Cl. 427-27.000.

Goby, Larry G., to Reynolds Manufacturing Company. Land leveling scrapers. 4,389,800, Cl. 37-124.000.

Goeke, George L.: *See*—
Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils, 4,390,677, Cl. 526-348.600.

Goetz, Michael A.; McCormick, Pamela A.; and Monaghan, Richard L., to Merck & Co., Inc. Antiparasitic macrolide from a strain of *Streptomyces hygroscopicus*. 4,390,546, Cl. 424-279.000.

Gokan, Hiroshi: *See*—
Esho, Sotaro; and Gokan, Hiroshi, 4,390,404, Cl. 204-192.00E.

Golan, Michael G.; and Desrosiers, Leo, to Kendall Company, The. Web takeoff roll. 4,389,753, Cl. 19-106.00R.

Golay, Jean-Pierre; and Uberti, Jean-Louis, to Mefina S.A. Fuze for non-spinning projectiles. 4,389,937, Cl. 102-249.000.

Goldberg, Alfred L.; Swamy, K. H. Sreedhara; and Chung, Chin H., to President and Fellows of Harvard College. Polypeptide degrading enzymes. 4,390,629, Cl. 435-220.000.

Goldberg, Ernest: *See*—
Trembly, Gray C.; Goldberg, Ernest; and Dragun, Edward B., 4,389,940, Cl. 102-489.000.

Golden, James E.: *See*—
Suffi, Louis; Golden, James E.; and Burtelson, Frederick W., 4,390,744, Cl. 174-41.000.

Goldenberg, Frank G. Disposable rain poncho system. 4,390,096, Cl. 206-390.000.

Goldfinger, Paul. Garment carrying device. 4,390,087, Cl. 190-41.00B.

Goldner, Walther: *See*—
Resag, Jorg; Goldner, Walther; and Treiber, Horst, 4,390,207, Cl. 297-362.000.

Goldowsky, Michael P.: *See*—
United States of America, National Aeronautics and Space Administration; Gasser, Max G.; Sherman, Allan; Studer, Philip A.; Daniels, Alexander; and Goldowsky, Michael P., 4,389,849, Cl. 62-6.000.

Goldsmith, Wesely R.; and Di Marco, Joel E. Sine-bar gage-blocks and direct reading micrometer adjustment. 4,389,785, Cl. 33-174.00S.

Goldsworthy, John; Ross, William J.; and Verge, John P., to Lilly Industries Limited. Quinolone derivatives and their use in a method of controlling an immediate hypersensitivity disease. 4,390,541, Cl. 424-258.000.

Gonzalez, Hector M., to Philip Morris Incorporated. Modular conveyor guide and system utilizing same. 4,390,091, Cl. 198-358.000.

Goodman, Donald: *See*—
Koral, Marvin; and Goodman, Donald, 4,390,459, Cl. 252-511.000.

Goodson, Raymond E.: *See*—
Martin, Harry L.; and Goodson, Raymond E., 4,390,841, Cl. 324-427.000.

Goodyear Tire & Rubber Company, The: *See*—
Balogh, Louis J.; Fitzhugh, Raymond L.; Kimes, Dale S.; and Weinstein, Myron, 4,389,788, Cl. 33-178.00D.
Colvin, Howard A.; and Muse, Joel, Jr., 4,390,741, Cl. 585-258.000.
Mendiola, Joseph V.; and Smith, David E., 4,390,052, Cl. 152-356.00R.
Tung, William C. T., 4,390,687, Cl. 528-295.000.
Wideman, Lawson G., 4,390,742, Cl. 585-854.000.

Gorecki, Marian; Acquaye, Clemenceau T. A.; Wilchek, Meir; and Rich, Alexander, to Yeda Research & Development Co. Ltd. Pharmaceutical agents for the treatment of sickle cell disease. 4,390,526, Cl. 424-177.000.

Gorick, Joel C.; and Mayhall, Riley H., Jr., to Gorick, Joel C. Lamp assembly. 4,390,931, Cl. 362-267.000.

Gorog, Sandor: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Cam mechanism for limited slip or locking differential. 4,389,909, Cl. 74-711.000.
Gotman, Alexander, to Presco, Inc. Precise quick-release positioning mechanism. 4,390,172, Cl. 269-56.000.
Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,390,534, Cl. 424-246.000.
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Gozzo, Franco; Troiani, Nicola; Lorusso, Simone; and Santi, Romano, to Montedison S.p.A. Fungicidal N-substituted ethylendiamino-dithiocarbamates which do not give rise to the formation of ethylenthiourea. 4,390,705, Cl. 549-3.000.
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Graetz, Clive W.; Thompson, Morice W.; and Bromley, Charles, to Imperial Chemical Industries Limited; and Dulux Australia Limited. Coating compositions. 4,390,658, Cl. 524-512.000.
Graham, Anne M.: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,390,639, Cl. 518-713.000.
Graham, Patricia A.: *See*—
Gabrielsen, Rolf S.; Graham, Patricia A.; Klijanowicz, James E.; and Stern, Max H., 4,390,606, Cl. 430-9.000.
Granda, Edward J.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,390,464, Cl. 252-522.00R.
Grau, James A., to Schlumberger Technology Corporation. Spectroscopic analysis with background compensation. 4,390,783, Cl. 250-270.000.
Graves, Howard K., to Valen Mfg. Co. Electrical outlet box. 4,390,105, Cl. 220-3.600.
Green, Carmel H. Metering toy for selecting a self-propelled vehicle of greatest strength. 4,389,810, Cl. 46-264.000.
Green, John G., to Dow Chemical Company, The. Trimethylsilylation of cellulose. 4,390,692, Cl. 536-84.000.
GRETAG Aktiengesellschaft: *See*—
Celio, Tino; and Ott, Hans, 4,390,280, Cl. 356-445.000.
Griffin, Ernest E.: *See*—
Lowry, Joseph M.; and Griffin, Ernest E., 4,389,836, Cl. 56-12.700.
Griffing, Bruce F.: *See*—
Ghezzo, Mario; and Griffing, Bruce F., 4,390,393, Cl. 156-643.000.
Grip-Pak, Inc.: *See*—
Cunningham, Ernest R., 4,390,095, Cl. 206-150.000.
Grob & Co. Aktiengesellschaft: *See*—
Baumann, Hans, 4,390,045, Cl. 139-91.000.
Grogler, Gerhard: *See*—
Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, 4,390,640, Cl. 521-51.000.
Grossman, Morris G. Concealed door hinge. 4,389,748, Cl. 16-278.000.
Grotnes, Carl C., II, to Atlanta Grotnes Machine Company. Method and apparatus for making beads on drums. 4,389,875, Cl. 72-393.000.
Grove, Morgens W.; and Eriksen, Carl-Erik, to Dansk Industri Syndikat A/S. Method and apparatus for producing one or more hollow sand cores suitable for casting moulds. 4,390,056, Cl. 164-7.100.
Gruber, Bruce A., to Ashland Oil, Inc. Curable composition and use thereof. 4,390,675, Cl. 526-273.000.
Grudzinskas, Charles V.; Chen, Sow-Mei L.; and Wissner, Allan, to American Cyanamid Company. 16-Hydroxy-5-iodo-prostacyclin analogs of the 1 series. 4,390,711, Cl. 549-465.000.
Grumman Aerospace Corporation: *See*—
Rose, George R., Jr., 4,390,069, Cl. 169-15.000.
Grun, Ingo. Heat exchanger. 4,390,352, Cl. 55-208.000.
GTE Laboratories Incorporated: *See*—
Peek, Sanford C., 4,390,814, Cl. 315-320.000.
Peters, Thomas E.; and McColl, James R., 4,390,449, Cl. 252-301.60F.
GTE Products Corporation: *See*—
Audesse, Emery G.; Kendrick, George B.; and Chavan, Pratap P., 4,390,935, Cl. 362-306.000.
Houck, David L., 4,390,368, Cl. 75-251.000.
Lesinski, Leon C., 4,390,919, Cl. 361-56.000.
Rothwell, Harold L., Jr.; Gungle, W. Calvin; and Daignault, Alan, 4,390,811, Cl. 315-73.000.
Sojka, Richard J.; Braverman, Leonard W.; Guch, Steve, Jr.; and Clark, David J., 4,390,993, Cl. 372-87.000.
Gubau, Giuseppe; Roano, Domenico; and Quaranti, Giovanni, to Ing. C. Olivetti & C., S.p.A. Electronic typewriter. 4,390,293, Cl. 400-144.200.
Guch, Steve, Jr.: *See*—
Sojka, Richard J.; Braverman, Leonard W.; Guch, Steve, Jr.; and Clark, David J., 4,390,993, Cl. 372-87.000.
Gulf Research & Development Company: *See*—
Schulz, Johann G.; and Margosian, Daniel, 4,390,661, Cl. 524-878.000.
Gungle, W. Calvin: *See*—
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Gunter, Jonas L.; Haren, Doyle V.; Hofle, Anatoli; and Medford, Richard D., to Dayco Corporation. Crawler track structure having wear surface. 4,390,214, Cl. 305-35.00R.
Gupta, Aditya K.: *See*—
Higgins, J. Aiden; and Gupta, Aditya K., 4,390,851, Cl. 330-277.000.
Gustafson, Inc.: *See*—
Bartholomay, Donald O., 4,389,906, Cl. 73-863.550.
Gutierrez, Manuel, to United States of America, Interior. Capacitance probe sensor device. 4,389,900, Cl. 73-861.420.
Gyger, Paul; and Schar, Hugo, to Rieter Machine Works Limited. Apparatus for severing a fibre layer of staple fibres. 4,389,751, Cl. 19-0.350.
Gytel, Ulla B. Aluminium chloride composition and a method for its manufacture. 4,390,445, Cl. 252-175.000.
H. B. Fuller Company: *See*—
LaBelle, Stanley B.; and Hagquist, James A. E., 4,390,678, Cl. 528-60.000.
H. Niemeyer Sohne GmbH & Co. KG: *See*—
Barlage, Bruno, 4,390,070, Cl. 172-54.500.
Haagenson, Bruce: *See*—
Schleusner, Clifford E., 4,390,228, Cl. 339-113.00R.
Haas, Rudy E.; Smorol, Michael E.; Tobin, Curtis L.; and Walker, James J., Jr., to Carrier Corporation. Heat exchanger and fan and method of assembly. 4,390,059, Cl. 165-76.000.
Hagedorn, Leonard: *See*—
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Hagenah, Klaus: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,390,029, Cl. 131-109.0AB.
Hagquist, James A. E.: *See*—
LaBelle, Stanley B.; and Hagquist, James A. E., 4,390,678, Cl. 528-60.000.
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., to University of Missouri, Curators of the. Oxygen electrode and method for preparation thereof. 4,390,405, Cl. 204-415.000.
Hahn, James H., to Rush, David H. Electromechanical machine. 4,390,805, Cl. 310-154.000.
Haight, James Clifford: *See*—
Harmening-Pittiglio, Denise, 4,390,619, Cl. 435-2.000.
Hakansson, William, to Aktiebolaget Metka. Device for knife handle. 4,389,778, Cl. 30-338.000.
Hammer, Klaus-Dieter: *See*—
Heinrich, Wolfgang; Hammer, Klaus-Dieter; and Bytzek, Max, 4,390,569, Cl. 427-366.000.
Hammerschlag, Robert H. Aperture screen for the observation of bright objects with preservation of the resolution. 4,390,243, Cl. 350-319.000.
Hammerschmitt, Nikolaus. Separator for low viscosity fluids. 4,390,421, Cl. 210-86.000.
Hammond, Charles S., Jr.; and Mitchell, Henry D., Jr., to Western Electric Company, Inc. Forming a strand package having multiple coil lengths. 4,390,137, Cl. 242-54.00R.
Hammond, Dean C., Jr.; and Vickers, Paul T., to General Motors Corporation. Wall-flow monolith filter. 4,390,355, Cl. 55-523.000.
Hampton, William A.: *See*—
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Han, Je-Chin: *See*—
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Haner, Douglas: *See*—
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Hanna, Marie R.: *See*—
Boden, Richard M.; Licciardello, Michael; Maisano, Joseph J., Jr.; and Hanna, Marie R., 4,390,448, Cl. 252-187.260.
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,390,435, Cl. 252-2.600.
Hannah, John: *See*—
Beattie, Thomas R.; Hannah, John; and Johnston, David B. R., 4,390,693, Cl. 542-442.000.
Hanotier, Jacques D. V.; Bridoux, Monique J. S.; and Dauby, Jacques F., to Labofina S.A. Process for the oxidation of hydrocarbons. 4,390,472, Cl. 260-398.600.
Hansch, Ferdinand: *See*—
Janssen, Harald; and Hansch, Ferdinand, 4,390,686, Cl. 528-289.000.
Hanyuda, Toshiaki: *See*—
Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.
Haraikawa, Tetsuo; and Tamura, Koichi, to Tokico Ltd. Mechanical disc brake. 4,390,084, Cl. 188-71.700.
Harbison, William C.: *See*—
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,390,373, Cl. 106-287.120.
Hard, Robert A.; and Prieto, Martin A., to Occidental Research Corporation. Process for making titanium metal from titanium ore. 4,390,365, Cl. 75-84.400.
Hardigg Industries, Inc.: *See*—
Turner, E. Wayne, 4,390,384, Cl. 156-221.000.
Hardin, George E. Dry pre-mixed mortar. 4,390,372, Cl. 106-90.000.
Haren, Doyle V.: *See*—
Gunter, Jonas L.; Haren, Doyle V.; Hofle, Anatoli; and Medford, Richard D., 4,390,214, Cl. 305-35.00R.

Hareng, Michel; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean Noel, to Thomson-CSF. Liquid crystal visual display unit and telephone terminal incorporating such a unit. 4,390,244, Cl. 350-333.000.
Hargrave, John C. Elastomer formulated fishing product. 4,389,805, Cl. 43-43.140.
Harmening-Pittiglio, Denise, to Haight, James Clifford. Leukocyte or platelet storage using ion-exchange resins. 4,390,619, Cl. 435-2.000.
Harms, Harold B.: *See*—
Erdman, David M.; and Harms, Harold B., 4,390,826, Cl. 318-439.000.
Harrell, John W., to Mobil Oil Corporation. Two receiver noise loggers. 4,390,878, Cl. 340-856.000.
Harris, Robert F.: *See*—
Hoffman, Dwight K.; Harris, Robert F.; Tefertiller, Nancy B.; and Rains, Randall C., 4,390,645, Cl. 521-137.000.
Harrison, Eugene O.; Martin, David J.; and Olson, Martin L. Enteral feeding system. 4,390,017, Cl. 604-270.000.
Hart, Dean W.: *See*—
Langlois, Henry J.; Hart, Dean W.; and Blazek, Gary J., 4,390,321, Cl. 417-15.000.
Hart, Peter J.: *See*—
Scinta, James; and Hart, Peter J., 4,390,411, Cl. 208-11.0LE.
Hart, Randall A., to Lexus Liting, Inc. Portable switching unit. 4,390,926, Cl. 361-334.000.
Harte, Kenneth J.: *See*—
Smith, Donald O.; and Harte, Kenneth J., 4,390,789, Cl. 250-492.200.
Hartig, F. Gunter, to Siemens Aktiengesellschaft. Electronic arrangement for idling stabilization. 4,389,989, Cl. 123-339.000.
Hase, Friedrich-Wilhelm: *See*—
Frankle, Gerhard; and Hase, Friedrich-Wilhelm, 4,389,987, Cl. 123-300.000.
Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased (by Katoh, Tazuki, heir); and by Katoh, Mankichi, heir, to Ricoh Company, Ltd. Layered charge generator/transport electrophotographic photoconductor uses bisazo pigment. 4,390,608, Cl. 430-57.000.
Hasselberg, Herbert: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.
Hastings, Thomas M. High security locking assembly for lockrods type rear-end closures of cargo vehicles. 4,389,862, Cl. 70-2.000.
Hatanaka, Katsunori; Uzawa, Shunichi; Hirai, Yutaka; and Ayata, Naoki, to Canon Kabushiki Kaisha. Solid-state photoelectric transducer. 4,390,791, Cl. 250-578.000.
Hauni-Werke Korber & Co. KG: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,390,029, Cl. 131-109.0AB.
Havinga, Reginoldus; Torenbeek, Reinder; and Schreurs, Petrus H. M., to AKZO N.V. Concentrated aqueous metal aldonate and/or ammonium aldonate composition. 4,390,451, Cl. 252-311.000.
Haworth Mfg., Inc.: *See*—
Wisniewski, Joseph M.; and Mrotz, Walter C., III, 4,390,210, Cl. 297-452.000.
Hayashi, Kiyoshi: *See*—
Murata, Naoaki; Yoshioka, Masahiro; Hayashi, Kiyoshi; and Tohi, Yasusuke, 4,390,264, Cl. 355-8.000.
Hayashi, Soichiro; and Suenaga, Yoshihiko, to Hitachi, Ltd. Electron beam patterning method and apparatus with correction of deflection distortion. 4,390,788, Cl. 250-491.100.
Hayata, Shinzi: *See*—
Morita, Yoshinori; Hayata, Shinzi; Kato, Akifumi; Nara, Hideo; and Watanabe, Tohru, 4,390,669, Cl. 526-65.000.
Hayes, Alan B., to Burroughs Corporation. Asynchronous data transmission system with state variable memory and handshaking protocol circuits. 4,390,969, Cl. 364-900.000.
Hayes, Gerald G.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,390,156, Cl. 249-80.000.
Hazama, Katashi: *See*—
Kishimoto, Kiyoharu; Hazama, Katashi; and Yuhara, Akitsuna, 4,390,807, Cl. 310-313.00B.
Hazeltine Corporation: *See*—
Freyre, Frederick W., 4,390,247, Cl. 350-358.000.
Heep, Dieter, to Waeschle Machinenfabrik GmbH. Method of and arrangement for supplying a fuel to a plurality of burners of a furnace. 4,389,949, Cl. 110-101.0CF.
Heikel, Rodney W., to R. J. Reynolds Tobacco Company. Method and apparatus for detecting articles moving in a continuous stream. 4,390,779, Cl. 377-6.000.
Heil-Quaker Corporation: *See*—
Beehler, Richard F., 4,390,219, Cl. 339-14.00R.
Heinrich Baumgarten KG Eisen- und Blechwarenfabrik: *See*—
Fischbach, Wolfgang, 4,390,200, Cl. 294-27.00H.
Heinrich, Bruno: *See*—
Schwenk, Wilhelm; Heinrich, Bruno; and Mangen, Rolf, 4,390,568, Cl. 427-234.000.
Heinrich, Wolfgang; Hammer, Klaus-Dieter; and Bytzek, Max, to Hoechst Aktiengesellschaft. Process for forming a polymeric coating on the outside surface of a length of tubing. 4,390,569, Cl. 427-366.000.
Hellmuth, Eckhard W.: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,390,405, Cl. 204-415.000.
Henderson, Donald S.: *See*—
Ritter, Ronald E.; and Henderson, Donald S., 4,390,416, Cl. 208-120.000.
Henderson, John G. N.: *See*—
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., 4,390,902, Cl. 358-192.100.
Henderson, Wilmer P.: *See*—
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,389,947, Cl. 109-1.00S.
Hendrickson, Max S. Key-actuated electrical lock. 4,390,758, Cl. 200-43.000.
Hendrickson, William A.: *See*—
Chou, Hsin-hsin; and Hendrickson, William A., 4,390,607, Cl. 430-48.000.
Hendry, James W., to KMMCO Structural Foam, Inc. Apparatus for injection molding of parts from foam plastics material and/or from solid plastics material. 4,390,332, Cl. 425-4.00R.
Hendry, James W.; and Han, Je-Chin, to Ex-Cell-O Corporation. Method and apparatus for heating a mold cavity uniformly. 4,390,486, Cl. 264-45.500.
Henmi, Kojiro; and Takenaka, Kiyosi, to Dainippon Screen Manufacturing Co., Ltd. Copying machine. 4,390,269, Cl. 355-27.000.
Henne, Werner; and Scheuren, Jurgen, to Akzo N.V. Catalytic membranes in artificial organs. 4,390,455, Cl. 252-430.000.
Hennessy, Richard E.; Frymire, Roger; and Coovert, Cary, to Honeywell Information Systems Inc. Automated bank transaction security system. 4,390,968, Cl. 364-900.000.
Henoch, Bengt, to Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm. Radio communication system and transmitter and receiver equipment therefor. 4,390,880, Cl. 343-6.8LC.
Henrickson, Clifford: *See*—
Howze, Bruce; and Henrickson, Clifford, 4,390,078, Cl. 181-185.000.
Henry, Hugh A. Bath tub head rest. 4,389,740, Cl. 4-575.000.
Henschen, Agnes: *See*—
Brantl, Victor; Henschen, Agnes; Teschemacher, Hansjorg; and Lottspeich, Friedrich, 4,390,527, Cl. 424-177.000.
Herenyi, Bulcsu: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.
Hernandez, Pablo M., to S. C. Johnson & Son, Inc. Aqueous film forming lubricant useful in a method for drawing aluminum and other soft metals. 4,390,436, Cl. 252-49.300.
Herpers, Lodewijk-Jozef, to Medtronic, Inc. Implantable medical device and power source depletion control therefor. 4,390,020, Cl. 128-419.0PG.
Herring, Charles H. Lure case. 4,389,806, Cl. 43-57.100.
Herst, Douglas J.; and Ngai, Peter Y. Y., to Herst Lighting Co. Indirect lighting fixture with improved light control. 4,390,930, Cl. 362-224.000.
Herst Lighting Co.: *See*—
Herst, Douglas J.; and Ngai, Peter Y. Y., 4,390,930, Cl. 362-224.000.
Hertrich, Friedrich R.; and Perera, Slobodan R., to Digital Equipment Corporation. Transducer positioning system and data disk therefor. 4,390,912, Cl. 360-78.000.
Herz, Claus: *See*—
Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, 4,390,453, Cl. 252-426.000.
Hesston Corporation: *See*—
Garrison, Harold K.; and Ratzlaff, Howard J., 4,390,092, Cl. 198-638.000.
Hewlett-Packard Company: *See*—
Ainsworth, Gerald L., 4,390,990, Cl. 371-57.000.
Higashiyama, Naotoshi; and Doi, Kazuyuki, to Nippon Electric Co., Ltd. Stereo signal demodulator having an improved separation characteristic. 4,390,746, Cl. 179-1.0GE.
Higgins, J. Aiden; and Gupta, Aditya K., to Rockwell International Corporation. Monolithic microwave amplifier having active impedance matching. 4,390,851, Cl. 330-277.000.
Higo, Nobumasa: *See*—
Kataoka, Masami; and Higo, Nobumasa, 4,389,902, Cl. 73-861.770.
Higuchi, Kazuya: *See*—
Ito, Susumu; Saito, Sadayuki; and Higuchi, Kazuya, 4,390,167, Cl. 266-48.000.
Higuchi, Yasushi: *See*—
Matsuno, Masahiro; Higuchi, Yasushi; Ohishi, Yutaka; Nakayama, Yoshiki; and Yazawa, Chihiro, 4,390,723, Cl. 562-478.000.
Hile, James R., to Carrier Corporation. Method and apparatus for controlling an air conditioning unit with multi-speed fan and economizer. 4,389,853, Cl. 62-89.000.
Hill, Harold I.: *See*—
O'Neill, Michael J.; and Hill, Harold I., 4,390,290, Cl. 374-142.000.
Hill, Raymond G. Liquid mixing systems. 4,390,035, Cl. 137-99.000.
Hillmer, Adolf: *See*—
Dull, Hans-Jurgen; and Hillmer, Adolf, 4,389,942, Cl. 104-103.000.
Hilti Aktiengesellschaft: *See*—
Boeni, Hans; Meier, Beda; and Szacsvay, Gabor, 4,389,870, Cl. 72-354.000.
Hirai, Shigeo: *See*—
Sueyoshi, Toshinobu; Hirai, Shigeo; and Amemiya, Masahiro, 4,390,361, Cl. 75-0.5BA.
Hirai, Yutaka: *See*—
Hatanaka, Katsunori; Uzawa, Shunichi; Hirai, Yutaka; and Ayata, Naoki, 4,390,791, Cl. 250-578.000.

Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Iijima, Takeshi, to Ricoh Company, Ltd. Toner concentration control apparatus. 4,389,972, Cl. 118-691.000.

Hirano, Shigeo: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, 4,390,618, Cl. 430-543.000.

Hiratake, Susumu. Plasma torch and a method of producing a plasma. 4,390,772, Cl. 219-121.0PQ.

Hirohata, Michio; Ogawa, Yukio; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Electromagnetically operated diaphragm shutter. 4,390,262, Cl. 354-230.000.

Hiroki, Nobuyoshi: *See*—
Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, 4,390,166, Cl. 266-44.000.

Hirosa, Takeshi: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, 4,390,618, Cl. 430-543.000.

Hirose, Isamu: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Suyama, Nobuo, 4,390,682, Cl. 528-194.000.

Hirvonen, Vesa: *See*—
Flander, Walter; Leikas, Jukka; and Hirvonen, Vesa, 4,389,764, Cl. 29-416.000.

Hisano, Jinpei: *See*—
Yasui, Koichi; and Hisano, Jinpei, 4,390,493, Cl. 264-328.160.

Hitachi, Ltd.: *See*—
Hayashi, Soichiro; and Suenaga, Yoshihiko, 4,390,788, Cl. 250-491.100.
Kajiyama, Shigeru, 4,389,894, Cl. 73-637.000.
Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, 4,390,603, Cl. 429-30.000.
Kishimoto, Kiyoharu; Hazama, Katashi; and Yuhara, Akitsuna, 4,390,807, Cl. 310-313.00B.
Miyauchi, Katsuki; Oi, Tetsu; and Suganuma, Tsuneo, 4,390,460, Cl. 252-518.000.
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isao, 4,390,058, Cl. 165-1.000.
Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; and Iwasaki, Syunji, 4,390,747, Cl. 179-1.0SC.
Sugiura, Kazumasa; Mori, Kinji; Ihara, Hirokazu; and Kawai, Yoshinori, 4,390,984, Cl. 370-88.000.
Tsukiyama, Nobuyoshi; and Ichige, Ryo, 4,390,461, Cl. 252-519.000.
Ueda, Toshimichi; Tezuka, Akira; Wakairo, Seiichi; Sakuma, Moriyuki; and Mochizuki, Masashi, 4,389,855, Cl. 62-200.000.
Yamashita, Kiichi; Nakagawa, Junichi; and Kaji, Tadao, 4,390,960, Cl. 364-703.000.

Hitachi Maxell, Ltd.: *See*—
Sueyoshi, Toshinobu; Hirai, Shigeo; and Amemiya, Masahiro, 4,390,361, Cl. 75-0.5BA.

Hobart Corporation: *See*—
Margraf, Dallas A.; and Treiber, Fritz F., 4,390,390, Cl. 156-566.000.

Hoda, Syed N., to Corning Glass Works. Calcium fluorophlogopite glass-ceramics. 4,390,634, Cl. 501-3.000.

Hodes, Erich; Sternina, Danilo; and Schneider, Walter, to Glyco-Metall-Werke Daelen & Loos GmbH. Method for producing top surfacing layers. 4,390,563, Cl. 427-27.000.

Hoechst Aktiengesellschaft: *See*—
Heinrich, Wolfgang; Hammer, Klaus-Dieter; and Bytzek, Max, 4,390,569, Cl. 427-366.000.
Walz, Gerd; Wirth, Thaddaus; and Sprenger, Walter, 4,390,688, Cl. 528-295.300.
Wiedemann, Wolfgang, 4,390,609, Cl. 430-58.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,390,544, Cl. 424-267.000.

Hoefer, William G.: *See*—
Noble, Milton L.; and Hoefer, William G., 4,390,816, Cl. 315-370.000.

Hoehn, John W. Method and apparatus for depacking articles. 4,390,313, Cl. 414-412.000.

Hoesselbarth, Helmut, to Wurttembergische Metallwarenfabrik. Coffee machine. 4,389,924, Cl. 99-289.00R.

Hoffman, Dwight K.; Harris, Robert F.; Tefertiller, Nancy B.; and Rains, Randall C., to Dow Chemical Company, The. Stable dispersions of polymers in polyfunctional compounds having a plurality of active hydrogens and polyurethanes therefrom. 4,390,645, Cl. 521-137.000.

Hoffmann, Christian; Zollner, Manfred; and Zwicker, Eberhard, to Siemens Aktiengesellschaft. Method and apparatus for generating electrocutaneous stimulation patterns for the transmission of acoustic information. 4,390,756, Cl. 179-107.0BC.

Hoffmann, Dietrich: *See*—
Kriechbaum, Karl; Augustin, Hans-Georg; and Hoffmann, Dietrich, 4,390,764, Cl. 200-148.00A.

Hoffmann-La Roche Inc.: *See*—
Chodnekar, Madhukar S.; Kaiser, Ado; and Kienzle, Frank, 4,390,540, Cl. 424-251.000.
Manchand, Percy, 4,390,718, Cl. 560-122.000.
Walser, Armin; and Fryer, Rodney I., 4,390,471, Cl. 260-244.400.

Hofle, Anatoli: *See*—
Gunter, Jonas L.; Haren, Doyle V.; Hofle, Anatoli; and Medford, Richard D., 4,390,214, Cl. 305-35.00R.

Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Beier, Sybille, to Schering, A.G. 3-Deoxy-Δ^{15}-steroids. 4,390,530, Cl. 424-238.000.

Hogg, James W. Novel continuous, high speed method of galvanizing and annealing a continuously travelling low carbon ferrous wire. 4,390,377, Cl. 148-12.00B.

Hohn, Cletus R. Electrical plug for a receptacle having a plurality of contact pins. 4,390,226, Cl. 339-89.00M.

Hokushin Electric Works, Ltd.: *See*—
Kimura, Atsushi, 4,390,879, Cl. 340-870.370.

Holan, George; and O'Keefe, David F., to Commonwealth Scientific and Industrial Research Organization. Pentafluorobenzyl esters. 4,390,715, Cl. 424-282.000.

Holberg, Douglas R., to Mostek Corporation. Tone generator circuit. 4,390,754, Cl. 179-84.0VF.

Holden, Durrell W., to Bond Cote of Virginia, Inc. Durable flexible membrane and method of making same. 4,390,585, Cl. 428-172.000.

Holland-Letz, Gunter, to Esselte Pendaflex Corporation. Hand labelling apparatus. 4,389,934, Cl. 101-92.000.

Hollandse Signaalapparaten B.V.: *See*—
Ploumen, Hubert J., 4,390,896, Cl. 358-73.000.

Holstein und Kappert GmbH: *See*—
Knabe, Uwe, 4,389,833, Cl. 53-167.000.

Holzwarth, Dietmar: *See*—
Rieger, Hansjorg; and Holzwarth, Dietmar, 4,390,053, Cl. 152-213.00A.

Honeywell Inc.: *See*—
Chynoweth, William R.; and Erickson, Roger D., 4,390,887, Cl. 346-155.000.
Kasprzyk, Donald J.; Margenau, David A.; and Nelson, Marvin D., 4,390,859, Cl. 338-25.000.
Szonntagh, Eugene L., 4,389,876, Cl. 73-27.00R.

Honeywell Information Systems Inc.: *See*—
Hennessy, Richard E.; Frymire, Roger; and Coovert, Cary, 4,390,968, Cl. 364-900.000.
Negi, Virendra S.; and Tague, Steven A., 4,390,961, Cl. 364-756.000.
Twibell, Jerome J.; and Crawford, Knute S., 4,390,943, Cl. 364-200.000.

Honjo, Takeshi: *See*—
Furuichi, Masayoshi; Honjo, Takeshi; and Akiba, Nobuo, 4,390,268, Cl. 355-15.000.

Honma, Akira: *See*—
Osaka, Hiroshi; and Honma, Akira, 4,390,899, Cl. 358-120.000.

Hoogovens Ijmuiden B.V.: *See*—
Cramer, Rudolph E.; and Ouwerkerk, Johannes H. W., 4,390,346, Cl. 48-180.00R.

Hook, Gerald C.: *See*—
Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., 4,390,885, Cl. 346-140.00R.

Hooper Trading Company: *See*—
Frabricius, Hans-Ake; and Stahn, Roland, 4,390,623, Cl. 435-68.000.

Hopf, Philip W.: *See*—
Strahan, Robert M.; Hopf, Philip W.; and Williams, Phillip G., 4,390,193, Cl. 280-777.000.

Horiba, Tatsuo: *See*—
Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, 4,390,603, Cl. 429-30.000.

Horii, Wataru: *See*—
Shimizu, Keiichiro; and Horii, Wataru, 4,390,245, Cl. 350-343.000.

Horikawa, Kazuo: *See*—
Ohara, Yuji; and Horikawa, Kazuo, 4,390,882, Cl. 346-1.100.

Horinouchi, Atsushi, to Sanyo Electric Co., Ltd. Apparatus and method for controlling electronic controlled cooking apparatus having storage. 4,390,766, Cl. 219-10.55B.

Horky, Joseph F.; and Dockal, Ronald J., to Burroughs Corporation. Input/output subsystem using card reader-peripheral controller. 4,390,964, Cl. 364-900.000.

Hoss, Richard: *See*—
Dreier, Ernst; and Hoss, Richard, 4,389,952, Cl. 112-128.00R.

Hotta, Hiroshi: *See*—
Komazawa, Hiroyasu; Mori, Tadashi; Ikenaga, Yukio; Hotta, Hiroshi; and Nakashima, Tuneyasu, 4,390,684, Cl. 528-230.000.

Hotvedt, Kevin. Test unit for a logic circuit analyzer. 4,390,837, Cl. 324-73.00R.

Houck, David L., to GTE Products Corporation. Flame spray powder. 4,390,368, Cl. 75-251.000.

Houlihan, John T., to Timex Corporation. Timepiece with multifunctional member. 4,390,289, Cl. 368-286.000.

Houston, John M., to General Electric Company. Method and apparatus for tone controlled variable sensitivity time-of-day watt-hour metering. 4,390,839, Cl. 324-116.000.

Howell, Donald R., deceased: *See*—
Tatters, Ronald; Dolman, John E.; and Howell, Donald R., deceased, 4,389,922, Cl. 92-156.000.

Howell, June E., executrix: *See*—
Tatters, Ronald; Dolman, John E.; and Howell, Donald R., deceased, 4,389,922, Cl. 92-156.000.

Howlett, John L. Wind velocity gage for sailboats. 4,389,887, Cl. 73-189.000.

Howmet Aluminum Corp.: *See*—
Cary, Lloyd H., 4,389,828, Cl. 52-665.000.
Player, Wayne H., 4,389,823, Cl. 52-200.000.

Howze, Bruce; and Henrickson, Clifford, to Community Light & Sound, Inc. Loudspeaker horn. 4,390,078, Cl. 181-185.000.

Hoya Corporation: *See*—
Fujita, Yoshimi; and Yamashita, Toshiharu, 4,390,391, Cl. 156-628.000.
Tatsumi, Kazutsune, 4,390,242, Cl. 350-318.000.

Hozeski, Kenneth W.: *See*—
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.

Hruda, Robert M., to Westinghouse Electric Corp. Electrochemical cell shunting switch assembly with matrix array of switch modules. 4,390,763, Cl. 200-144.00B.

HTC Corporation, The: *See*—
Spigarelli, Donald J.; and Dustin, Paul C., 4,389,797, Cl. 34-73.000.

Huber, Erich, to Johannes Heidenhain GmbH. Projection screen. 4,390,239, Cl. 350-120.000.

Huber, Lothar; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for establishing and terminating connections between crankshafts. 4,389,985, Cl. 123-198.00F.

Huchette, Michel; and Leroy, Patrick, to Roquette Freres. Sorbose for inhibiting fermentation acids in the mouth. 4,390,523, Cl. 424-48.000.

Hudson Oxygen Therapy Sales Company: *See*—
Bartholomew, Victor L., 4,390,013, Cl. 128-55.000.

Hughes Aircraft Company: *See*—
Yamagishi, Frederick G., 4,390,595, Cl. 428-446.000.

Huisl, Herbert F., to Colosio Cesare. Knitting machine. 4,389,859, Cl. 66-224.000.

Hukuta, Masakazu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Fuel tank cap for motor vehicle. 4,390,107, Cl. 220-202.000.

Humphreys, John A.; and Humphreys, Michael D. P. Article mounting rack. 4,390,101, Cl. 211-41.000.

Humphreys, Michael D. P.: *See*—
Humphreys, John A.; and Humphreys, Michael D. P., 4,390,101, Cl. 211-41.000.

Hunten, Dieter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Plate-type filter. 4,390,427, Cl. 210-333.010.

Husband, Wallace T., to E-Z-Rect Metal Products Ltd. Shelving system. 4,390,103, Cl. 211-182.000.

Husqvarna: *See*—
Bergvall, Bengt A., 4,389,953, Cl. 112-158.00E.

Hutch Protective Devices Ltd.: *See*—
Taylor, William H., 4,390,199, Cl. 292-346.000.

Hutchinson, Albert L.: *See*—
Capasso, Federico; Hutchinson, Albert L.; and Logan, Ralph A., 4,390,889, Cl. 357-30.000.

Hutson, Marvin R.; and Dutmers, Louis G., to Omark Industries, Inc. Wood chipper. 4,390,132, Cl. 241-55.000.

Hutter, Charles G., III, to Physical Systems, Inc. Adhesive attachment assembly. 4,390,576, Cl. 428-40.000.

Hwang, Sung T. Folding furniture piece. 4,389,946, Cl. 108-115.000.

Hyde, Paul E.; and Rowell, John A., to Neptune Microfloc, Inc. Method and apparatus for wetting powder. 4,390,284, Cl. 366-165.000.

Hydra Rig Incorporated: *See*—
Elliston, Thomas L., 4,390,315, Cl. 414-740.000.

I. W. Industries, Inc.: *See*—
Warshawsky, Jerome, 4,390,933, Cl. 362-270.000.

Ibigawa Electric Industry Co. Ltd.: *See*—
Enomoto, Ryo; Yoshioka, Michihiro; and Yokoyama, Takao, 4,390,504, Cl. 422-166.000.

Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerant gas heater system for display cabinets. 4,389,856, Cl. 62-248.000.

Ibuki, Rinta: *See*—
Ohnishi, Norio; and Ibuki, Rinta, 4,390,694, Cl. 544-22.000.

Ichige, Ryo: *See*—
Tsukiyama, Nobuyoshi; and Ichige, Ryo, 4,390,461, Cl. 252-519.000.

ICI Americas Inc.: *See*—
Rutledge, Thomas F., 4,390,731, Cl. 568-643.000.

Igarashi, Akira: *See*—
Sato, Kozo; Iwakura, Ken; and Igarashi, Akira, 4,390,616, Cl. 430-338.000.

Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel mixture heating device for internal combustion engine. 4,390,000, Cl. 123-549.000.

Ihara Chemical Industry Co., Ltd.: *See*—
Matsuno, Masahiro; Higuchi, Yasushi; Ohishi, Yutaka; Nakayama, Yoshiki; and Yazawa, Chihiro, 4,390,723, Cl. 562-478.000.

Ihara, Hirokazu: *See*—
Sugiura, Kazumasa; Mori, Kinji; Ihara, Hirokazu; and Kawai, Yoshinori, 4,390,984, Cl. 370-88.000.

IHC Holland N.V.: *See*—
de Keizer, Cornelis, 4,390,942, Cl. 364-162.000.

Iijima, Takeshi: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Iijima, Takeshi, 4,389,972, Cl. 118-691.000.

Ikeda, Tomoaki: *See*—
Ono, Yoshihiro; Nabara, Akira; and Ikeda, Tomoaki, 4,390,601, Cl. 428-412.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Wide angle zoom lens. 4,390,248, Cl. 350-427.000.

Ikemura, Masaaki: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.

Ikenaga, Yukio: *See*—
Komazawa, Hiroyasu; Mori, Tadashi; Ikenaga, Yukio; Hotta, Hiroshi; and Nakashima, Tuneyasu, 4,390,684, Cl. 528-230.000.

Illinois Tool Works Inc.: *See*—
Engstrom, Keith A., 4,390,866, Cl. 340-365.00E.

Imahashi, Issei, to Telmec Co., Ltd. Linear motor. 4,390,827, Cl. 318-687.000.

Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for use in the polymerization of α-olefins and a method of using the same. 4,390,671, Cl. 526-125.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Photographic lens system. 4,390,250, Cl. 350-465.000.

Imperial Chemical Industries Limited: *See*—
Cogswell, Frederic N.; and Mitchell, David T., 4,390,581, Cl. 428-71.000.
Graetz, Clive W.; Thompson, Morice W.; and Bromley, Charles, 4,390,658, Cl. 524-512.000.

Imperial Chemical Industries PLC: *See*—
Waddan, Dhafir Y.; and Williams, Derek, 4,390,738, Cl. 568-857.000.

Imperial Clevite Inc.: *See*—
Kowal, Leonard J., 4,389,872, Cl. 72-388.000.
Schwarz, Albert J.; and Kowal, Leonard J., 4,389,873, Cl. 72-388.000.

Inaba, Naomi: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,390,671, Cl. 526-125.000.

Inco Limited: *See*—
Lea, Richard K.; Edwards, Julian D.; and Colton, D. Frederick, 4,390,366, Cl. 75-101.0BE.

Industrial Adhesive, Inc.: *See*—
Getz, John L., 4,389,966, Cl. 118-405.000.

Industrie Chemie Thoma GmbH & Co. Produktions KG: *See*—
Thoma, Matthias, 4,390,726, Cl. 564-242.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Albrile, Walter, 4,390,295, Cl. 400-330.100.
Gubau, Giuseppe; Roano, Domenico; and Quaranti, Giovanni, 4,390,293, Cl. 400-144.200.

Ingeberg, Bjorn. Anchorage with accessories for attachment to walls, floors and ceilings. 4,389,830, Cl. 52-710.000.

Inland Steel Company: *See*—
Rastogi, Prahbat K., 4,390,378, Cl. 148-111.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,390,278, Cl. 356-392.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for inspecting the accuracy of a machined contour in a workpiece. 4,390,278, Cl. 356-392.000.

Inoue, Yasuhiko; Wake, Shigeo; Sirafuji, Tamio; and Beppu, Masazo, to Sumitomo Chemical Company, Limited. Process for producing phenols. 4,390,736, Cl. 568-801.000.

Insituform International Inc.: *See*—
Wood, Eric, 4,390,574, Cl. 428-36.000.

Institut Francais du Petrole: *See*—
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., 4,390,431, Cl. 210-724.000.
Chevalier, Andre, 4,390,229, Cl. 339-115.00R.

Interface Systems, Inc.: *See*—
Eglowstein, Ira; and Solender, Peter E., 4,390,967, Cl. 364-900.000.

Intermedics, Inc.: *See*—
Calfee, Richard V.; and Miner, Jay, 4,390,022, Cl. 128-419.0PG.

International Business Machines Corporation: *See*—
Applegate, Steven L.; and Lloyd, Edward R., 4,390,884, Cl. 346-139.00C.
Bergeron, David L.; and Patel, Parsotam T., 4,390,890, Cl. 357-44.000.
Bocinski, Terrance E.; and Knight, Alan D., 4,389,770, Cl. 29-764.000.
Bowden, Larry D.; Miyashita, Albert H.; and Ravenelle, Charles I., 4,390,610, Cl. 430-58.000.
Chow, William W.; and Dunn, Larry P., 4,390,916, Cl. 360-127.000.
Cosgrove, James F.; Dahlke, Gerhard P.; and Wurms, Charles, 4,390,571, Cl. 427-43.100.
Curtis, Huntington W.; Kellogg, Robert M.; Kissinger, Kerry W.; Mappes, Robert P.; and Stephans, Emery J., 4,390,499, Cl. 422-72.000.
Fowler, Alan B.; Rosenberg, Robert; and Rupprecht, Hans S., 4,389,768, Cl. 29-571.000.
Gaitos, Janise N.; Shattuck, Meredith D.; and Wilbur, Clayton V., 4,390,297, Cl. 400-697.100.
Garwin, Richard L., 4,390,868, Cl. 340-568.000.
Klaassen, Klaas B., 4,390,911, Cl. 360-77.000.

International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,390,443, Cl. 252-174.110.
Boden, Richard M.; Licciardello, Michael; Maisano, Joseph J., Jr.; and Hanna, Marie R., 4,390,448, Cl. 252-187.260.
Boden, Richard M., 4,390,462, Cl. 252-522.00R.
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., 4,390,463, Cl. 252-522.00R.
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,390,434, Cl. 252-8.600.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,390,464, Cl. 252-522.00R.
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,390,435, Cl. 252-8.600.

Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Antos V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.
International Harvester Co.: *See*—
Luck, Karl-Heinz; Kallenberg, Albert; Schnippering, Manfred; and Moeselaken, Herbert, 4,389,757, Cl. 24-205.10R.
International Minerals & Chemical Corp.: *See*—
Seeney, Charles E., 4,390,370, Cl. 106-38.300.
International Shoe Machine Corporation: *See*—
Becka Michael M., 4,389,745, Cl. 12-142.00T.
International Telephone & Telegraph: *See*—
Vincent, Arthur L., 4,390,515, Cl. 423-573.00G.
International Telephone and Telegraph Corporation: *See*—
John, Robert S., 4,390,793, Cl. 307-118.000.
Williams, William H.; and Burke, Michael G., 4,390,982, Cl. 370-67.000.
Interox: *See*—
De Ceuster, Jean; and Papageorges, Georges, 4,390,395, Cl. 162-5.000.
Introvigne, Angelo J., to Cole Hersee Company. High current switching. 4,390,761, Cl. 200-67.00C.
Inuzuka, Tsuneki: *See*—
Suzuki, Koji; Inuzuka, Tuneki; and Kurita, Kenji, 4,390,265, Cl. 355-14.00D.
Ishibashi, Hiroaki: *See*—
Nishikawa, Masahiko; Ishibashi, Hiroaki; and Furukawa, Hidenori, 4,390,691, Cl. 536-65.000.
Ishida, Yasuhiko: *See*—
Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, 4,390,000, Cl. 123-549.000.
Ishigaki, Yoshio: *See*—
Nagai, Tamiji; and Ishigaki, Yoshio, 4,390,818, Cl. 315-408.000.
Ishihama, Toshio: *See*—
Niibori, Kenji; and Ishihama, Toshio, 4,390,054, Cl. 160-265.000.
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, to Japan Synthetic Rubber Co., Ltd. Process for preparing carboxylic acid esters of dicyclopentadienes. 4,390,717, Cl. 560-114.000.
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; and Kitahara, Makoto. Electrophotographic photosensitive azo pigment containing members. 4,390,611, Cl. 430-59.000.
Ishikawa, Wataru: *See*—
Okaniwa, Kenichiro; Masukawa, Toyoaki; Yamashita, Kiyoshi; and Ishikawa, Wataru, 4,390,617, Cl. 430-350.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Koike, Takaaki, 4,389,845, Cl. 60-602.000.
Matsui, Kunio; Tsuchiya, Hiroaki; and Suzuki, Ryushi, 4,390,351, Cl. 55-204.000.
Ishimoto, Shoji, to Nippon Electric Co., Ltd. Semiconductor circuit. 4,390,797, Cl. 307-264.000.
Isley, Ralph E., to Standard Oil Company. Nitrile barrier resins containing fillers and processing aids. 4,390,652, Cl. 524-322.000.
Ito, Susumu; Saito, Sadayuki; and Higuchi, Kazuya, to Kawasaki Steel Corporation. Apparatus for removing torch-cutting slag of slab. 4,390,167, Cl. 266-48.000.
Itoi, Kazuo: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.
ITT Industries, Inc.: *See*—
Berisch, Volker, 4,390,213, Cl. 303-24.00A.
Miskin, Leslie, 4,390,849, Cl. 330-251.000.
Schulein, Rolf-Gunter; and Hagedorn, Leonard, 4,390,109, Cl. 220-234.000.
Iwakura, Ken: *See*—
Sato, Kozo; Iwakura, Ken; and Igarashi, Akira, 4,390,616, Cl. 430-338.000.
Iwamoto, Kazuo: *See*—
Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, 4,390,603, Cl. 429-30.000.
Iwasaki, Syunji: *See*—
Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; and Iwasaki, Syunji, 4,390,747, Cl. 179-1.0SC.
Iwaya, Hirokatsu; Saigo, Hiroshi; and Suzuki, Takashi, to Iwaya Kabushiki Kaisha. Bird action toy. 4,389,811, Cl. 46-232.000.
Iwaya Kabushiki Kaisha: *See*—
Iwaya, Hirokatsu; Saigo, Hiroshi; and Suzuki, Takashi, 4,389,811, Cl. 46-232.000.
Izuno, Sadami; Kiyomitsu, Isao; and Tsuji, Toshihiko, to Toyo Kogyo Co., Ltd.; and Delta Kogyo Co., Ltd. Plastic seat-back framework and method for the manufacture thereof. 4,390,209, Cl. 297-410.000.
J. M. Voith GmbH: *See*—
Rohde, Gunter; and Kuhn, Friedrich, 4,390,138, Cl. 242-55.000.
Jackle, Heiner G.: *See*—
Bach, Dieter; Jackle, Heiner G.; and Marquardt, Kurt, 4,389,879, Cl. 73-61.00R.
Jackson, Wilbur C.: *See*—
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,389,772, Cl. 30-43.900.
Jacobs, Merle E., to Board of Overseers of Goshen College. Composition and process for producing pigmentation in hair or skin. 4,390,341, Cl. 8-424.000.
Jacobsen, Robert S.: *See*—
Cornforth, Malcolm W.; and Jacobsen, Robert S., 4,390,956, Cl. 364-510.000.
Jacobson, Arthur E.: *See*—
Brossi, Arnold; Schmidhammer, Helmut; and Jacobson, Arthur E., 4,390,699, Cl. 546-74.000.
Jacobson, Carl C., Jr.; and Manning, Mark C., to Crafco, Inc. Crushed rock applicator mechanism. 4,390,304, Cl. 404-110.000.
Jacobson, Sava. End of rewind detection in a telephone answering device having remote playout. 4,390,751, Cl. 179-6.070.
Jacobson, Sava. Ring detection circuit for a telephone answering device. 4,390,752, Cl. 179-6.160.
Jacoby, Charles E.: *See*—
Berk, Donald M.; Jacoby, Charles E.; and Reagan, Larry, 4,389,941, Cl. 104-49.000.
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, to Societe Anonyme dite: L'Oreal. Cosmetic agents based on cationic polymers, cosmetic compositions containing the same and the use of said cosmetic agents. 4,390,522, Cl. 424-45.000.
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, to Societe Anonyme dite: L'Oreal. Polycationic polymers and their preparation. 4,390,689, Cl. 528-335.000.
Jaffa, David; and Szarka, Sandor, to Precision Screen Machines, Inc. Cleaning attachment for screen printer. 4,389,936, Cl. 101-123.000.
James Howden Australia Pty. Limited: *See*—
Miljoen, Rodney W., 4,390,353, Cl. 55-304.000.
Jamesbury Corporation: *See*—
Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, 4,390,039, Cl. 137-315.000.
Jamgotchian, George H. Magnetic electrical connector. 4,390,232, Cl. 339-224.000.
Jancy Engineering Co.: *See*—
Fangmann, Michael D., 4,390,309, Cl. 408-76.000.
Janome Sewing Machine Co. Ltd.: *See*—
Makabe, Hachiro; and Tanaka, Haruhiko, 4,389,954, Cl. 112-158.00E.
Janssen, Daniel J. G., to U.S. Philips Corporation. Line interruption arrangement. 4,390,753, Cl. 179-81.00R.
Janssen, Harald; and Hansch, Ferdinand, to Dr. Beck & Co. AG. Polyester-amide resin. 4,390,686, Cl. 528-289.000.
Janssen, Johannes A.: *See*—
Weterings, Cornelis A. M.; and Janssen, Johannes A., 4,390,507, Cl. 423-8.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ishikawa, Katuhiro; Ohno, Ryotaro; and Arakawa, Masatoshi, 4,390,717, Cl. 560-114.000.
Jaqua, Vance W., to Rockwell International Corporation. Ultrasonic check valve and diesel fuel injector. 4,389,999, Cl. 123-536.000.
Jaques, Diane H.: *See*—
Jaques, Michael J.; and Jaques, Diane H., 4,389,813, Cl. 47-67.000.
Jaques, Michael J.; and Jaques, Diane H. Planter tree for floor, wall or ceiling mounting. 4,389,813, Cl. 47-67.000.
Jarrett, Robert B., to Motorola, Inc. Shunt voltage regulator circuit. 4,390,829, Cl. 323-231.000.
Jen-Tung, Cheng, to Kuo-Yung Industrial Company. Method for producing fuel gas from limestone. 4,390,349, Cl. 48-197.00R.
Jennings, Daniel T.; Carniglia, Charles K.; and Young, David B., to United States of America, Agriculture. Method and apparatus for automatic egg mass counting. 4,390,787, Cl. 250-459.100.
Jepsen, Henry E. Heat engine. 4,389,858, Cl. 62-498.000.
Jeroszko, Ronald A.: *See*—
Markowski, Stanley J.; Jeroszko, Ronald A.; and Lohmann, Robert P., 4,389,848, Cl. 60-738.000.
Jimpo, Kiyokazu: *See*—
Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, 4,390,535, Cl. 424-246.000.
Jitsugiri, Yukio: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.
Joel & Aronoff, Inc.: *See*—
Sharrock, Michael; Fry, Donovan N.; and William, Robert, 4,389,801, Cl. 40-159.000.
Johannes Heidenhain GmbH: *See*—
Huber, Erich, 4,390,239, Cl. 350-120.000.
Johannesson, Orn: *See*—
Kristinsson, Sigurdur; and Johannesson, Orn, 4,389,750, Cl. 17-63.000.
Johannsmeier, Hans-Dieter: *See*—
Buchholz, Hagen; Johannsmeier, Hans-Dieter; and Vock, Friedrich, 4,390,126, Cl. 239-1.000.
Johansen, Jack T., to De Forenede Bryggerier A/S. Process for isolating Cu, Zn-superoxide dismutase from aqueous solutions containing said enzyme together with accompanying proteins. 4,390,628, Cl. 435-189.000.
John, Robert S., to International Telephone and Telegraph Corporation. Electronic liquid level control apparatus. 4,390,793, Cl. 307-118.000.
Johnson Controls, Inc.: *See*—
Cabou, Christian G., 4,390,959, Cl. 364-557.000.
Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, to Jamesbury Corporation. Valve assembly and disassembly device. 4,390,039, Cl. 137-315.000.
Johnson, Fred D., to Zenith Radio Corporation. Integratable CRT spot cut-off network. 4,390,817, Cl. 315-384.000.
Johnson, Irvin D.: *See*—
Bruce, Charles R.; and Johnson, Irvin D., 4,390,836, Cl. 324-54.000.

Johnson, Keith R., to Copar Corporation. Glue detector. 4,389,969, Cl. 118-665.000.

Johnson, Matthey & Co., Limited: *See*—
Enga, Bernard E.; and Prasad, Christopher, 4,389,983, Cl. 123-143.00B.

Johnson Products Co., Inc.: *See*—
Khalil, Ezzat N.; and Syed, Ali N., 4,390,033, Cl. 132-7.000.

Johnston, David B. R.: *See*—
Beattie, Thomas R.; Hannah, John; and Johnston, David B. R., 4,390,693, Cl. 542-442.000.

Johnston, Howard R.; and Koombes, Michael E. R. V., to Shelton Video Editors, Inc. Automatic circuit and method for editing commercial messages from television signals. 4,390,904, Cl. 358-335.000.

Johnstone, Richard, to Kearney & Trecker Corporation. Unmanned diagnostic communications system for computer controlled machine tools. 4,390,953, Cl. 364-474.000.

Jones, Eric D.: *See*—
Thomas, Kenneth C.; Jones, Eric D.; and McBride, Marvin A., 4,390,777, Cl. 219-127.000.

Jones, Stanley C.: *See*—
Wygant, N. Duane; and Jones, Stanley C., 4,390,842, Cl. 324-439.000.

Jorephani, Karim. Apparatus suitable for use in removing or reducing a crease or tangle in a magnetic recording tape of a cassette. 4,390,146, Cl. 242-200.000.

Jorgensen, Bernard A., to Lockheed Corporation. Aircraft decompression vent assembly. 4,390,152, Cl. 244-118.500.

Jorgensen, Robert J.: *See*—
Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils, 4,390,677, Cl. 526-348.600.

Joseph Galkin Corporation: *See*—
Block, Charles; and Mintz, Leon, 4,389,957, Cl. 112-262.300.

Jovanita Inc.: *See*—
Albert, Lionel, 4,390,965, Cl. 364-400.000.

Joyner, Auvin H. Stock/sauce separator. 4,389,926, Cl. 99-495.000.

Judd, O'Dean P., to United States of America, Energy. Plasma channel optical pumping device and method. 4,390,992, Cl. 372-70.000.

Judova, Galina N.: *See*—
Rusinov, Mikhail M.; Judova, Galina N.; Kudryashov, Jury V.; and Agurok, Peisakh Y., 4,390,249, Cl. 350-453.000.

Junter, Guy-Alain; Lemeland, Jean-Francois; Selegny, Eric; and Vingent, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and composition for the detection and study of cellular activity or the like and means for applying such method. 4,390,620, Cl. 435-4.000.

Justus Technik GmbH Industrie-Anlagen: *See*—
Vornfett, Karl-Ulrich, 4,390,782, Cl. 250-223.00B.

Kabelmetal Electro GmbH: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.

Kabushiki Kaisha Chiyoda: *See*—
Sugawara, Isao, 4,390,939, Cl. 363-129.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Miyoshi, Taisuke, 4,390,246, Cl. 350-357.000.

Kabushiki Kaisha Hosokawa Yoko: *See*—
Niwa, Susumu, 4,390,552, Cl. 426-126.000.

Kabushiki Kaisha Mitutoya Seisakusho: *See*—
Sakata, Hideo; and Takahashi, Seigo, 4,389,783, Cl. 33-143.00K.

Kabushiki Kaisha Morita Seisakusho: *See*—
Matsui, Takahiro; and Watanabe, Minoru, 4,390,932, Cl. 362-269.000.
Okano, Michiaki; and Furuichi, Shuhei, 4,390,028, Cl. 128-777.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Hukuta, Masakazu, 4,390,107, Cl. 220-202.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tanasawa, Yasusi, 4,389,986, Cl. 123-298.000.

Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Intermediate mositure frozen foods. 4,390,550, Cl. 426-102.000.

Kaiser, Ado: *See*—
Chodnekar, Madhukar S.; Kaiser, Ado; and Kienzle, Frank, 4,390,540, Cl. 424-251.000.

Kaji, Tadao: *See*—
Yamashita, Kiichi; Nakagawa, Junichi; and Kaji, Tadao, 4,390,960, Cl. 364-703.000.

Kajiyama, Shigeru, to Hitachi Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Cylindrical guide rail for detector. 4,389,894, Cl. 73-637.000.

Kakei, Tsutomu: *See*—
Mori, Teruo; Shirai, Hiroshi; Kakei, Tsutomu; Watanabe, Masaru; and Matsuhisa, Tsuneyasu, 4,390,407, Cl. 204-206.000.

Kallenberg, Albert: *See*—
Luca, Karl-Heinz; Kallenberg, Albert; Schnippering, Manfred; and Moeselaken, Herbert, 4,389,757, Cl. 24-205.10R.

Kamath, Venkatesh: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.

Kamensky, Vladimir K.: *See*—
Khusnutdinov, Gil D.; Chernovol, Arkady V.; Shumikhin, Vladimir S.; Shulga, Vasily T.; Poteiko, Andrei I.; Kamensky, Vladimir K.; Kondakov, Jury A.; and Shmigidin, Viktor G., 4,390,362, Cl. 75-49.000.

Kamimura, Yoichi: *See*—
Yoshioka, Issei; and Kamimura, Yoichi, 4,390,525, Cl. 424-71.000.

Kanada, Toshiaki; Suzuki, Kazuhiro; Yoshioka, Hiroshi; Maeda, Kenji; and Tsurumi, Yoshihiro, to Mitsubishi Gas Chemical Co., Inc. Process for producing amine formaldehyde resin foam. 4,390,643, Cl. 521-117.000.

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Kaneko, Hogara. Tool for strap tensioning and cutting. 4,390,047, Cl. 140-93.200.

Kardos, Karl; Mattsson, Bertil; and Westermark, Olle, to Produktutvecklingscentrum i Goteborg. Universal furnace. 4,390,004, Cl. 126-104.00A.

Karl, Alfons; Buder, Wolfgang; and Kleinschmit, Peter, to Degussa AG. Aqueous solution of cationic organosilicon compounds and process for the production of the solutions. 4,390,712, Cl. 556-413.000.

Karliner, Rudolf, to Wagner Spray Tech Corporation. Pressure release valve for pumps. 4,390,324, Cl. 417-282.000.

Karlsson, Jarding U.; and Moosberg, Borje S., to ABU Aktiebolag. Centrifugal brake for fishing reels. 4,390,140, Cl. 242-84.52C.

Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils. Article molded from ethylene hydrocarbon copolymer. 4,390,677, Cl. 526-348.600.

Kasama, Masatoshi, to Kinugawa Pacific Kabushiki Kaisha. Clasp for swimming article. 4,389,756, Cl. 24-171.000.

Kasley, Paul A.: *See*—
Puhl, Larry C.; and Kasley, Paul A., 4,390,963, Cl. 364-900.000.

Kasprzyk, Donald J.; Margenau, David A.; and Nelson, Marvin D., to Honeywell, Inc. Flectric thermostat with adjusting knob. 4,390,859, Cl. 338-25.000.

Kast, Jack L.; Eddy, Albert R.; and Carter, Merle F., to Remington Arms Company, Inc. Firing pin block for firearm with a rotary breech bolt. 4,389,919, Cl. 89-185.000.

Kasuya, Yutaka: *See*—
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,390,536, Cl. 424-246.000.

Katagiri, Kazuharu: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; and Kitahara, Makoto, 4,390,611, Cl. 430-59.000.

Kataoka, Masami; and Higo, Nobumasa, to Nippondenso Co., Ltd. Flow rate transducer. 4,389,902, Cl. 73-861.770.

Kato, Akifumi: *See*—
Morita, Yoshinori; Hayata, Shinzi; Kato, Akifumi; Nara, Hideo; and Watanabe, Tohru, 4,390,669, Cl. 526-65.000.

Kato, Kenneth J.; and Frollini, Dominick, Jr., to Allied Corporation. Repiaceable outer junction double junction reference electrode. 4,390,406, Cl. 204-435.000.

Kato, Masatake, to Canon Kabushiki Kaisha. Photographic objectives of relatively large aperture. 4,390,251, Cl. 350-467.000.

Kato, Shozo: *See*—
Takeuchi, Hidetsugu; Muramatsu, Tsuyoshi; and Kato, Shozo, 4,389,871, Cl. 72-356.000.

Kato, Toshifumi, to Ricoh Company, Ltd. Sheet clamping device. 4,390,176, Cl. 271-270.000.

Katoh, Mankichi, heir: *See*—
Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, heir, 4,390,608, Cl. 430-57.000.

Katoh, Tatsuya, deceased: *See*—
Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, heir, 4,390,608, Cl. 430-57.000.

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Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, heir, 4,390,608, Cl. 430-57.000.

Katz, Lester: *See*—
Lacy, Lewis L.; Robinson, Michael B.; Rathz, Thomas J.; Katz, Lester; and Nisen, Daniel B., 4,389,904, Cl. 73-863.110.

Kavalieros, Tony. Safety hopples. 4,389,835, Cl. 54-71.000.

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Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.

Kawai, Yoshinori: *See*—
Sugiura, Kazumasa; Mori, Kinji; Ihara, Hirokazu; and Kawai, Yoshinori, 4,390,984, Cl. 370-88.000.

Kawakami, Fukushi: *See*—
Niimi, Koji; and Kawakami, Fukushi, 4,389,892, Cl. 73-586.000.

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Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Morita, Satoshi, 4,390,737, Cl. 568-804.000.

Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, to Hitachi, Ltd. Methanol fuel cell. 4,390,603, Cl. 429-30.000.

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Ogita, Yasuhiro; Kawasaki, Kazuya; Nagao, Kouichi; and Mori, Naoki, 4,389,854, Cl. 62-157.000.

Kawasaki Steel Corporation: *See*—
Ito, Susumu; Saito, Sadayuki; and Higuchi, Kazuya, 4,390,167, Cl. 266-48.000.

Kawasaki, Teruo: *See—*
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.

Kawashima, Keisuke; Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, to Omron Tateisi Electronics Co. Sequence controller. 4,390,966, Cl. 364-900.000.

Kay, Brian, to Texas Instruments Incorporated. Rotating register utilizing field effect transistors. 4,390,970, Cl. 365-73.000.

Kearney & Trecker Corporation: *See—*
Johnstone, Richard, 4,390,953, Cl. 364-474.000.

Kehlhofer, Rolf, to BBC Brown, Boveri & Company, Limited. Method for the rapid increase in output of a steam turbine plant. 4,389,847, Cl. 60-659.000.

Keiser, Edmond. Method and apparatus for controlling the operation of a television signal receiver. 4,390,901, Cl. 358-147.000.

Kellogg, Robert M.: *See—*
Curtis, Huntington W.; Kellogg, Robert M.; Kissinger, Kerry W.; Mappes, Robert P.; and Stephans, Emery J., 4,390,499, Cl. 422-72.000.

Kelly, Thomas L. Plate bonded system on top of rubber and method of preparing same. 4,389,826, Cl. 52-410.000.

Kelpin, Charles A.: *See—*
Sviatoslavsky, Nicolas N.; and Kelpin, Charles A., 4,390,114, Cl. 220-337.000.

Kempkers, Gordon: *See—*
Flowerday, Carl; Marcus, Konrad H.; Kempkers, Gordon; Boerema, Edward T.; and Fleming, Dennis J., 4,390,202, Cl. 296-97.00K.

Kendall Company, The: *See—*
Golan, Michael G.; and Desrosiers, Leo, 4,389,753, Cl. 19-106.00R.

Kendrick, George B.: *See—*
Audesse, Emery G.; Kendrick, George B.; and Chavan, Pratap P., 4,390,935, Cl. 362-306.000.

Kennedy, Carl S.; and Zellmann, Fred, to Nalco Chemical Company. Dibasic acids to reduce coefficient of friction in rolling oils. 4,390,438, Cl. 252-56.00D.

Key, Charles W.; and Christensen, Edward W., II, to RCA Corporation. Apparatus for influencing electron beam movement. 4,390,815, Cl. 315-368.000.

Khalil, Ezzat N.; and Syed, Ali N., to Johnson Products Co., Inc. Stable hair relaxer. 4,390,033, Cl. 132-7.000.

Khusnutdinov, Gil D.; Chernovol, Arkady V.; Shumikhin, Vladimir S.; Shulga, Vasily T.; Poteiko, Andrei I.; Kamensky, Vladimir K.; Kondakov, Jury A.; and Shmigidin, Viktor G. Method and apparatus for out-of-furnace treatment of cast iron. 4,390,362, Cl. 75-49.000.

Kienzle, Frank: *See—*
Chodnekar, Madhukar S.; Kaiser, Ado; and Kienzle, Frank, 4,390,540, Cl. 424-251.000.

Kimber, Edward G., to Tridon Limited. Connector for windshield wipers of low silhouette type. 4,389,746, Cl. 15-250.320.

Kimble, Alvin J. Process and apparatus for finishing doors. 4,390,564, Cl. 427-35.000.

Kimes, Dale S.: *See—*
Balogh, Louis J.; Fitzhugh, Raymond L.; Kimes, Dale S.; and Weinstein, Myron, 4,389,788, Cl. 33-178.00D.

Kimura, Atsushi, to Hokushin Electric Works, Ltd. Apparatus for converting physical quantities. 4,390,879, Cl. 340-870.370.

King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., to United States of America, Army. Blast suppressive shielding. 4,389,947, Cl. 109-1.00S.

Kinugasa, Yukio: *See—*
Yaegashi, Takehisa; and Kinugasa, Yukio, 4,389,996, Cl. 123-491.000.

Kinugawa Pacific Kabushiki Kaisha: *See—*
Kasama, Masatoshi, 4,389,756, Cl. 24-171.000.

Kirchbrucher, Rudiger: *See—*
Becker, Kunibert; Kirchbrucher, Rudiger; Lagodka, Gunter; and Pohlmann, Klaus-Dieter, 4,390,308, Cl. 405-299.000.

Kircher, Morton S., to Olin Corporation. Membrane electrode pack cells designed for medium pressure operation. 4,390,408, Cl. 204-284.000.

Kirsch, Steven T. Electronic mouse. 4,390,873, Cl. 340-710.000.

Kishi, Toru: *See—*
Saito, Takashi; and Kishi, Toru, 4,390,979, Cl. 369-270.000.

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Kiss, David B.: *See—*
Linton, Leon; and Kiss, David B., 4,389,944, Cl. 104-172.00S.

Kissinger, Kerry W.: *See—*
Curtis, Huntington W.; Kellogg, Robert M.; Kissinger, Kerry W.; Mappes, Robert P.; and Stephans, Emery J., 4,390,499, Cl. 422-72.000.

Kitahara, Makoto: *See—*
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; and Kitahara, Makoto, 4,390,611, Cl. 430-59.000.

Kitano, Kyozo: *See—*
Kondo, Fusao; Terao, Toshimi; Nagano, Katsumasa; and Kitano, Kyozo, 4,390,475, Cl. 260-505.00S.

Kitrilakis, Sotiris: *See—*
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., 4,389,737, Cl. 3-1.700.

Kiyomitsu, Isao: *See—*
Izuno, Sadami; Kiyomitsu, Isao; and Tsuji, Toshihiko, 4,390,209, Cl. 297-410.000.

Klaasen, Anne: *See—*
Kuiper, Wilhelmus G.; and Klaasen, Anne, 4,390,794, Cl. 307-140.000.

Klaassen, Klaas B., to International Business Machines Corporation. Signal separation in magnetic recording using buried servo. 4,390,911, Cl. 360-77.000.

Kleemann, Axel; and Schalke, Peter M., to Degussa Aktiengesellschaft. Process for the recovery of pure nitriles. 4,390,706, Cl. 349-74.000.

Kleemann, Axel: *See—*
Schwarze, Werner; Kleemann, Axel; and Leuchtenberger, Wolfgang, 4,390,719, Cl. 560-124.000.

Klein, Joseph T.: *See—*
Davis, Larry; and Klein, Joseph T., 4,390,544, Cl. 424-267.000.

Kleinewefers GmbH: *See—*
Pav, Josef, 4,389,932, Cl. 100-162.00B.
Pav, Josef, 4,389,933, Cl. 100-162.00B.

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Karl, Alfons; Buder, Wolfgang; and Kleinschmit, Peter, 4,390,712, Cl. 556-413.000.

Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Methyl substituted norbornane derivatives, organoleptic uses thereof and process for preparing same. 4,390,464, Cl. 252-522.00R.

Klijanowicz, James E.: *See—*
Gabrielsen, Rolf S.; Graham, Patricia A.; Klijanowicz, James E.; and Stern, Max H., 4,390,606, Cl. 430-9.000.

Klipfel, Siegfried: *See—*
Ebneth, Harold; and Klipfel, Siegfried, 4,390,588, Cl. 428-263.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Hunten, Dieter, 4,390,427, Cl. 210-333.010.

Klok, Jan W.: *See—*
Willems, Michael H.; and Klok, Jan W., 4,390,483, Cl. 264-7.000.

Klomp, Franciscus M., to U.S. Philips Corporation. Packaged electric lamp. 4,390,097, Cl. 206-418.000.

Klopper, Detlev: *See—*
Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, 4,390,773, Cl. 219-121.0PR.

Klotz, Marvin R., to Standard Oil Company (Indiana). Synthesis of molecular sieves using 2-aminopyridine as a template. 4,390,457, Cl. 252-455.00Z.

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KMMCO Structural Foam, Inc.: *See—*
Hendry, James W., 4,390,332, Cl. 425-4.00R.

Knabe, Uwe, to Holstein und Kappert GmbH. Bottle closing machine having bottle neck washing arrangement. 4,389,833, Cl. 53-167.000.

Knaggs, Edward A.: *See—*
Nussbaum, Marvin L.; and Knaggs, Edward A., 4,390,474, Cl. 260-505.00R.

Knickerbocker, Robert H., to Siemon Company, The. Modular block base and bracket assembly. 4,390,230, Cl. 339-125.00R.

Knifton, John F., to Texaco Inc. Process for producing propylene glycol monoalkyl ethers from acetaldehyde, an alkanol and syngas using a new catalyst system. 4,390,734, Cl. 568-678.000.

Knight, Alan D.: *See—*
Bocinski, Terrance E.; and Knight, Alan D., 4,389,770, Cl. 29-764.000.

Knoblauch, Jack R.: *See—*
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.

Knoll, Dieter, to Braun Aktiengesellschaft. Cover for a hot liquid container. 4,390,108, Cl. 220-228.000.

Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,390,618, Cl. 430-543.000.

Kobayashi, Ichiro: *See—*
Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.

Koblenzer, Heinz, to Langbein-Pfanhauser Werke AG. Apparatus for the distillation of vaporizable liquids. 4,390,396, Cl. 202-166.000.

Kodama, Hiroshi; and Seto, Tadayuki, to Toyo Kogyo Co. Ltd. Lubricating oil supply means for rotary piston engines. 4,390,330, Cl. 418-97.000.

Koder, Manfred; and Schmid, Gunther, to Robert Bosch GmbH. Method of and arrangement for determining the axial play between the stator and the rotor of an electric motor. 4,389,883, Cl. 73-119.00R.

Kohke, Stephen J.: *See—*
Byrd, William; and Kohke, Stephen J., 4,390,831, Cl. 323-240.000.

Kohler, Franz; and Meggl, Albert, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Automatic welding apparatus for solar cells. 4,390,770, Cl. 219-56.210.

Kohlpainter, Georg: *See—*
Lutz, Alfons; and Kohlpainter, Georg, 4,390,203, Cl. 296-223.000.

Koide, Kaoru; Yoneda, Yoshiki; and Musashi, Kenkichi, to Meiji Milk Products Company Limited. Process for producing a cream cheese-like food. 4,390,560, Cl. 426-582.000.

Koide, Toshikazu; and Yaegashi, Takehisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronically controlled fuel injection method and apparatus. 4,389,995, Cl. 123-491.000.

Koike, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor driver circuit. 4,390,803, Cl. 307-578.000.

Koike, Takaaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Turbine casing for turbochargers. 4,389,845, Cl. 60-602.000.

Kolehmainen, Seppo: *See*—
Berthold, Fritz; Kolehmainen, Seppo; and Tarkkanen, Veikko, 4,390,274, Cl. 356-36.000.

Kolodziejski, Stanislaw; Dwojak, Stanislaw; and Grabowski, Andrzej, to Przemyslowy Instytut Automa. ki i Pomiarow "MERA-PIAP". Impeller flow-meter pulsation damping. 4,389,897, Cl. 73-861.000.

Komatsu, Yasumasa: *See*—
Matsuda, Shunsuke; and Komatsu, Yasumasa, 4,390,382, Cl. 156-184.000.

Komazawa, Hiroyasu; Mori, Tadashi; Ikenaga, Yukio; Hotta, Hiroshi; and Nakashima, Tuneyasu, to Polyplastics Co., Ltd. Continuous polymerization method. 4,390,684, Cl. 528-230.000.

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Khusnutdinov, Gil D.; Chernovol, Arkady V.; Shumikhin, Vladimir S.; Shulga, Vasily T.; Poteiko, Andrei I.; Kamensky, Vladimir K.; Kondakov, Jury A.; and Shmigidin, Viktor G., 4,390,362, Cl. 75-49.000.

Kondo, Fusao; Terao, Toshimi; Nagano, Katsumasa; and Kitano, Kyozo, to Lion Corporation. Thin film type sulfonation process of alkylbenzene. 4,390,475, Cl. 260-505.00S.

Konishiroku Photo Industry Co., Ltd.: *See*—
Okaniwa, Kenichiro; Masukawa, Toyoaki; Yamashita, Kiyoshi; and Ishikawa, Wataru, 4,390,617, Cl. 430-350.000.

Koombes, Michael E. R. V.: *See*—
Johnston, Howard R.; and Koombes, Michael E. R. V., 4,390,904, Cl. 358-335.000.

Kopp, Clinton V., to Baxter Travenol Laboratories, Inc. Multichanneled diffusion device. 4,390,575, Cl. 428-36.000.

Kopp, Manfred K.; and Valentine, Kenneth H., to United States of America, Energy. Neutron detection apparatus. 4,390,786, Cl. 250-385.000.

Kopp, Richard: *See*—
Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, 4,390,640, Cl. 521-51.000.

Koppers Company, Inc.: *See*—
Szczerba, Stanley T., 4,390,397, Cl. 202-243.000.

Koral, Marvin; and Goodman, Donald, to Tenneco Chemicals, Inc. Conductive molding compositions comprising vinyl chloride-vinyl ether copolymers. 4,390,459, Cl. 252-511.000.

Korczak, Roman L., to Lutheran General Hospital, Inc. Calibrating unit. 4,389,886, Cl. 73-168.000.

Korhonen, Kaarlo J. Cutting-up process. 4,389,749, Cl. 17-46.000.

Kossebau, Friedrich K. O., to Gebrueder Buehler AG. Method and apparatus for dust free grain loading. 4,390,090, Cl. 193-32.000.

Kostler, Hans-Gunter: *See*—
Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, 4,390,538, Cl. 424-249.000.

Kotani, Makoto: *See*—
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Morita, Satoshi, 4,390,737, Cl. 568-804.000.

Kowal, Leonard J., to Imperial Clevite Inc. Tube bender construction. 4,389,872, Cl. 72-388.000.

Kowal, Leonard J.: *See*—
Schwarz, Albert J.; and Kowal, Leonard J., 4,389,873, Cl. 72-388.000.

Kowk, Ronald, to Kowk, Ruth C. Fireplace door assembly. 4,390,006, Cl. 126-140.000.

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Kowk, Ronald, 4,390,006, Cl. 126-140.000.

Krampe, Dietrich; and Schleicher, Herbert, to Siemens Aktiengesellschaft. Device for changing the relative angular positions of operating shafts of a group electric drive. 4,390,821, Cl. 318-85.000.

Krapcho, John; and Wade, Peter C., to E. R. Squibb & Sons, Inc. Imido, amido and amino derivatives of mercaptoacyl prolines and pipecolic acids. 4,390,695, Cl. 544-130.000.

Krasnobajew, Victor, to Givaudan Corporation. Microbiological transformations of alpha-ionone. 4,390,556, Cl. 426-538.000.

Krasnobajew, Victor, to Givaudan Corporation. Microbiological transformations of irone compounds. 4,390,557, Cl. 426-538.000.

Krasnov, Igor, to Varco International, Inc. Well slip unit. 4,389,760, Cl. 24-263.00D.

Krause, Gerhard. Apparatus for measuring the speed of flow of flowable media. 4,389,899, Cl. 73-861.280.

Krenz, Horst M., to Zenith Radio Corporation. Means and method for compensating for print medium thickness in line printers. 4,390,292, Cl. 400-59.000.

Kretschmer, Frank F.: *See*—
Lewis, Bernard L.; and Kretschmer, Frank F., 4,390,881, Cl. 343-100.0LE.

Kriechbauni, Karl; Augustin, Hans-Georg; and Hoffmann, Dietrich, to Licentia Patent-Verwaltungs-G.m.b.H. Puffer-type gas blast switch. 4,390,764, Cl. 200-148.00A.

Krippner, Mathilde. Head for passages, door and window openings. 4,389,822, Cl. 52-125.400.

Kristinsson, Sigurdur; and Johannesson, Orn, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Device for the beheading of fish. 4,389,750, Cl. 17-63.000.

Kruger, Jack L. Coaxial transmission line connector. 4,390,218, Cl. 339-9.00E.

Kubach, Hans, to Robert Bosch GmbH. Electromagnet. 4,390,857, Cl. 335-282.000.

Kubo, Kanji: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Taniguchi, Hiroshi; Kubo, Kanji; and Ohtsu, Masamitsu, 4,390,906, Cl. 360-19.100.

Kubo, Kazuhiro: *See*—
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,390,536, Cl. 424-246.000.

Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., to Westinghouse Electric Corp. Tube plug. 4,390,042, Cl. 138-89.000.

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Kudryashov, Jury V.: *See*—
Rusinov, Mikhail M.; Judova, Galina N.; Kudryashov, Jury V.; and Agurok, Peisakh Y., 4,390,249, Cl. 350-453.000.

Kugler, Ralph W.: *See*—
Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,390,042, Cl. 138-89.000.

Kuhlmann, Gerhard, to Robert Bosch GmbH. Tool support for tool machines. 4,390,311, Cl. 409-232.000.

Kuhn, Friedrich: *See*—
Rohde, Gunter; and Kuhn, Friedrich, 4,390,138, Cl. 242-55.000.

Kuiper, Wilhelmus G.; and Klaassen, Anne, to U.S. Philips Corporation. Circuit arrangement for controlling the switch-on of supply voltage. 4,390,794, Cl. 307-140.000.

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Kuo, Chang-Kiang, to Texas Instruments Incorporated. Post-metal programmable MOS read only memory. 4,390,971, Cl. 365-104.000.

Kuo-Yung Industrial Company: *See*—
Jen-Tung, Cheng, 4,390,349, Cl. 48-197.00R.

Kurafuji, Setsuo, to Fujitsu Limited. Bias-voltage generator. 4,390,798, Cl. 307-296.00R.

Kuraray Co., Ltd.: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.

Kurata, Hirotaka; and Yoshida, Shiro, to Trio Kabushiki Kaisha. Circuit for reproducing a clock signal. 4,390,801, Cl. 307-409.000.

Kurata, Nobuo: *See*—
Okamoto, Miyoshi; Yoshida, Syusuke; and Kurata, Nobuo, 4,390,572, Cl. 428-15.000.

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Suzuki, Koji; Inuzuka, Tsuneki; and Kurita, Kenji, 4,390,265, Cl. 355-14.00D.

Kurtz, John A.; and Cousens, Donald E., to Fairchild Camera & Instrument Corp. Bonding wire ball forming method and apparatus. 4,390,771, Cl. 219-56.220.

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Morishige, Morio, to Casio Computer Co., Ltd. Electronic device having time display function. 4,390,287, Cl. 368-240.000.

Morita, Satoshi: *See*—
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Morita, Satoshi, 4,390,737, Cl. 568-804.000.

Morita, Yoshinori; Hayata, Shinzi; Kato, Akifumi; Nara, Hideo; and Watanabe, Tohru, to Mitsui Petrochemical Industries, Ltd. Process for multi-step gas-phase polymerization of olefins. 4,390,669, Cl. 526-65.000.

Morooka, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Level meter. 4,389,888, Cl. 73-299.000.

Moses, Donald W., to Seismograph Service Corporation. Digital subscriber communication system. 4,390,986, Cl. 370-99.000.

Mostek Corporation: *See*—
Holberg, Douglas R., 4,390,754, Cl. 179-84.0VF.

Motor-und Turbinen-Union GmbH: *See*—
Butscher, Franz, 4,389,846, Cl. 60-606.000.

Motorola, Inc.: *See*—
Davis, William F.; and Shacter, Stuart B., 4,390,850, Cl. 330-253.000.
Jarrett, Robert B., 4,390,829, Cl. 323-231.000.
Puhl, Larry C.; and Kasley, Paul A., 4,390,963, Cl. 364-900.000.
Selinko, George J., 4,390,198, Cl. 292-152.000.
Strickland, Lawrence P., 4,390,845, Cl. 329-103.000.
Woltz, Stephen H., 4,390,802, Cl. 307-475.000.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Ball bearing slide unit for linear motion. 4,390,215, Cl. 308-6.00C.

Mrotz, Walter C., III: *See*—
Wisniewski, Joseph M.; and Mrotz, Walter C., III, 4,390,210, Cl. 297-452.000.

MTU Motoren-und Turbinen-Union Muenche GmbH: *See*—
Weiler, Wolfgang, 4,390,318, Cl. 415-145.000.

Mueller, Fredrick N.; and Brown, Henry C., to Camsco, Inc. Carriage having integral spring. 4,390,216, Cl. 308-6.00R.

Mueller, Rolf J., to Textube Corporation. Yarn carrier. 4,390,144, Cl. 242-118.300.

Mukai, Yasuteru: *See*—
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isao, 4,390,058, Cl. 165-1.000.

Muller, Hans R., to Sundstrand Corporation. Angle of attack based pitch generator and head up display. 4,390,950, Cl. 364-434.000.

Muller, Helmut: *See*—
Durr, Herbert; Christen, Werner; and Muller, Helmut, 4,390,285, Cl. 366-168.000.

Muller, Johannes, to Mannesmann Aktiengesellschaft. Crane and hoist for steel manufacturing mill. 4,390,168, Cl. 266-142.000.

Muller, Peter: *See*—
Christen, Peter; and Muller, Peter, 4,390,869, Cl. 340-632.000.

Murakami, Reiji; and Nakajima, Shunichi. Dot matrix condition display device for photocopiers. 4,390,872, Cl. 340-679.000.

Muramatsu, Tsuyoshi: *See*—
Takeuchi, Hidetsugu; Muramatsu, Tsuyoshi; and Kato, Shozo, 4,389,871, Cl. 72-356.000.

Murata, Naoaki; Yoshioka, Masahiro; Hayashi, Kiyoshi; and Tohi, Yasusuke, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,390,264, Cl. 355-8.000.

Murdock, Robert H., to NEF Systems, Inc. Decorative glass panel railing assembly. 4,390,165, Cl. 256-24.000.

Murphy, Christy A.: *See*—
Barnes, Tracy L.; and Murphy, Christy A., 4,390,149, Cl. 244-31.000.

Murphy, Lynn M. R.: *See*—
Lee, Richard J.; and Murphy, Lynn M. R., 4,390,437, Cl. 252-51.50A.

Murphy, Wesley T. Metal roof system. 4,389,829, Cl. 52-693.000.

Murray, Alan B., to Control Logic (Proprietary) Limited. Servo apparatus for an automatic speed control of vehicles. 4,389,990, Cl. 123-353.000.

Murray, Michael J.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,390,156, Cl. 249-80.000.

Musashi, Kenkichi: *See*—
Koide, Kaoru; Yoneda, Yoshiki; and Musashi, Kenkichi, 4,390,560, Cl. 426-582.000.

Muse, Joel, Jr.: *See*—
Colvin, Howard A.; and Muse, Joel, Jr., 4,390,741, Cl. 585-258.000.

Musha, Toru, to Olympus Optical Co. Ltd. Method and apparatus for detecting focussing error signal of objective lens. 4,390,781, Cl. 250-204.000.

Muskogee Environmental Conservation Co.: *See*—
Scriminger, William F., 4,390,281, Cl. 366-3.000.

Mussinan, Cynthia J.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.

Muta, Gensuke: *See*—
Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, 4,390,166, Cl. 266-44.000.

Mutschler, Otto. India ink drawing implement. 4,390,299, Cl. 401-258.000.

Myers, Daryl L.; and Rice, Stanley, to Western Electric Company, Inc. Methods of and system for clean air delivery to lightguide fiber drawing apparatus. 4,390,357, Cl. 65-2.000.

Myers, George D., to Ashland Oil, Inc. High metal carbo-metallic oil conversion using low inventory of catalyst. 4,390,415, Cl. 208-113.000.

Nabara, Akira: *See*—
Ono, Yoshihiro; Nabara, Akira; and Ikeda, Tomoaki, 4,390,601, Cl. 428-412.000.

Nachtrieb, Paul W. Positive displacement four lobe impeller structure. 4,390,331, Cl. 418-141.000.

Nadella: *See*—
Mallet, Bernard, 4,390,303, Cl. 403-284.000.

Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, to Nitto Electric Industrial Co., Ltd.; and Kawa Co., Ltd. Antiphlogistic analgesic adhesive. 4,390,520, Cl. 424-28.000.

Nagai, Shinichi. Tape cassette and sound recording and reproducing apparatus for use therefor. 4,390,914, Cl. 360-96.500.
Nagai, Tamiji; and Ishigaki, Yoshio, to Sony Corporation. Television receiver. 4,390,818, Cl. 315-408.000.
Nagamata, Kiyoshi: *See*—
Aoki, Hachiro; Tomita, Hitoshi; and Nagamata, Kiyoshi, 4,389,998, Cl. 123-502.000.
Nagano, Katsumasa: *See*—
Kondo, Fusao; Terao, Toshimi; Nagano, Katsumasa; and Kitano, Kyozo, 4,390,475, Cl. 260-505.00S.
Nagao, Kouichi: *See*—
Ogita, Yasuhiro; Kawasaki, Kazuya; Nagao, Kouichi; and Mori, Naoki, 4,389,854, Cl. 62-157.000.
Nagata, Takao; and Rokutanbo, Yoshiyuki, to Nippon Jidoh Seiki Kabushiki Kaisha. Automatic splicer in tape feeder or the like. 4,390,388, Cl. 156-351.000.
Naimer, Hubert Laurenz: *See*—
Alsch, Gottfried, 4,390,855, Cl. 335-166.000.
Naito, Daiji: *See*—
Tabushi, Iwao; Shimokawa, Kazuhiro; Naito, Daiji; Misaki, Susumu; and Yoshida, Tsutomu, 4,390,740, Cl. 570-146.000.
Naito, Tadashi: *See*—
Noro, Shuhei; and Naito, Tadashi, 4,389,882, Cl. 73-118.000.
Najjar, Victor A., to Research Corporation. Tuftsinyl-tuftsin. 4,390,528, Cl. 424-177.000.
Nakagawa, Junichi: *See*—
Yamashita, Kiichi; Nakagawa, Junichi; and Kaji, Tadao, 4,390,960, Cl. 364-703.000.
Nakajima, Shunichi: *See*—
Murakami, Reiji; and Nakajima, Shunichi, 4,390,872, Cl. 340-679.000.
Nakamichi, Kazuya: *See*—
Sasaki, Takuma; and Nakamichi, Kazuya, 4,390,468, Cl. 260-112.00R.
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; and Yamada, Toshihiko, to Toyotomi Kogyo Co., Ltd. Petroleum combustion device. 4,390,003, Cl. 126-96.000.
Nakamura, Tadahiko; Nakano, Kenji; and Tajima, Shigeru, to Sony Corporation. Phase servo circuit. 4,390,908, Cl. 360-70.000.
Nakanishi, Yutaka: *See*—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; and Yamada, Toshihiko, 4,390,003, Cl. 126-96.000.
Nakano, Jiro; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronically controlled method and apparatus for varying the amount of fuel injected into an internal combustion engine with acceleration pedal movement and engine temperature. 4,389,997, Cl. 123-492.000.
Nakano, Kenji: *See*—
Nakamura, Tadahiko; Nakano, Kenji; and Tajima, Shigeru, 4,390,908, Cl. 360-70.000.
Nakashima, Tuneyasu: *See*—
Komazawa, Hiroyasu; Mori, Tadashi; Ikenaga, Yukio; Hotta, Hiroshi; and Nakashima, Tuneyasu, 4,390,684, Cl. 528-230.000.
Nakayama, Yoshiki: *See*—
Matsuno, Masahiro; Higuchi, Yasushi; Ohishi, Yutaka; Nakayama, Yoshiki; and Yazawa, Chihiro, 4,390,723, Cl. 562-478.000.
Nalco Chemical Company: *See*—
Kennedy, Carl S.; and Zellmann, Fred, 4,390,438, Cl. 252-56.00D.
Nappholz, Tibor A.: *See*—
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,390,021, Cl. 128-419.0PG.
Nara, Hideo: *See*—
Morita, Yoshinori; Hayata, Shinzi; Kato, Akifumi; Nara, Hideo; and Watanabe, Tohru, 4,390,669, Cl. 526-65.000.
Nasuno, Toshihiro; and Otoi, Kiyoshi, to Kanebo, Ltd. Makeup compositions in cake form including fibroin-coated and oily material-coated pigments. 4,390,524, Cl. 424-63.000.
Natale, Peter J.: *See*—
Lombardo, Igino; and Natale, Peter J., 4,390,484, Cl. 264-9.000.
National Institute for Researches in Inorganic Materials: *See*—
Fujiki, Yoshinori, 4,390,513, Cl. 423-598.000.
National Research Development Corporation: *See*—
Steen, William M.; and Duley, Walter W., 4,390,774, Cl. 219-121.0FS.
Ward, Ian M.; and McGrath, John C., 4,390,674, Cl. 526-255.000.
National Semiconductor Corporation: *See*—
Russell, Gilbert E.; and Wong, Hee, 4,390,893, Cl. 358-27.000.
Nawa, Hideo, to Aisin Seiki Kabushiki Kaisha. Color coded presser foot assembly. 4,389,956, Cl. 112-240.000.
Nawn, George H.: *See*—
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,390,613, Cl. 430-219.000.
Nebiker, Herman, Jr., to Rockwell International Corporation. Variable capacitor with gear train end stop. 4,390,924, Cl. 361-279.000.
NEF Systems, Inc.: *See*—
Murdock, Robert H., 4,390,165, Cl. 256-24.000.
Negi, Virendra S.; and Tague, Steven A., to Honeywell Information Systems Inc. Data processor performing a decimal multipiy operation using a read only memory. 4,390,961, Cl. 364-756.000.
Neisius, Karl-Heinz: *See*—
Eichler, Jurgen; Herz, Claus; and Neisius, Karl-Heinz, 4,390,453, Cl. 252-426.000.
Nelson, Donald L., to Dow Chemical Company, The. Phenolic hydroxyl-containing compositions and epoxy resins prepared therefrom. 4,390,680, Cl. 528-97.000.
Nelson, Gary L.: *See*—
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,390,373, Cl. 106-287.120.
Nelson, Marvin D.: *See*—
Kasprzyk, Donald J.; Margenau, David A.; and Nelson, Marvin D., 4,390,859, Cl. 338-25.000.
Nelson, Robert G., to Superwinch, Inc. Winch drive and brake mechanism. 4,390,161, Cl. 254-356.000.
Neptune Microfloc, Inc.: *See*—
Hyde, Paul E.; and Rowell, John A., 4,390,284, Cl. 366-165.000.
New England Nuclear Corporation: *See*—
O'Brien, Robert E.; and Tzodikov, Nathan R., 4,390,517, Cl. 424-1.000.
New York University: *See*—
Rugg, Barry; and Stanton, Robert, 4,390,375, Cl. 127-37.000.
Ngai, Peter Y. Y.: *See*—
Herst, Douglas J.; and Ngai, Peter Y. Y., 4,390,930, Cl. 362-224.000.
Nichols, Michael F.: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,390,405, Cl. 204-415.000.
Nicholson, Harold L., to Atlantic Richfield Company. Semi-continuous process for making star-block copolymers. 4,390,663, Cl. 525-53.000.
Nicholson, Terence P. Gaskets. 4,390,185, Cl. 277-235.00B.
Niehaus, Norbert; Popperling, Rolf; and Bester, Horst, to Mannesmann Aktiengesellschaft. High-alloyed steel being resistive to corrosion by natural gas. 4,390,367, Cl. 75-125.000.
Nifco Inc.: *See*—
Yuda, Takuo, 4,389,759, Cl. 24-214.000.
Niibori, Kenji; and Ishihama, Toshio, to Seiwa Kagaku Kabushiki Kaisha. Apparatus for opening and closing a flexible screen in a greenhouse or the like. 4,390,054, Cl. 160-265.000.
Niimi, Koji; and Kawakami, Fukushi, to Nippon Gakki Seizo Kabushiki Kaisha. Reverberation characteristics measuring device. 4,389,892, Cl. 73-586.000.
Nikko Kogyo Kabushiki Kaisha: *See*—
Sohma, Yoshio, 4,389,754, Cl. 24-16.0PB.
Niles, Paul D.; and Normann, Richard W., to Bendix Corporation, The. Modular connector assembly having an electrical contact. 4,390,221, Cl. 339-17.00M.
Nilsson, Sten E., to Saab-Scania Aktiebolag. Heating and ventilation system for vehicles. 4,390,124, Cl. 237-12.30A.
Nippon Electric Co., Ltd.: *See*—
Esho, Sotaro; and Gokan, Hiroshi, 4,390,404, Cl. 204-192.00E.
Higashiyama, Naotoshi; and Doi, Kazuyuki, 4,390,746, Cl. 179-1.0GE.
Ishimoto, Shoji, 4,390,797, Cl. 307-264.000.
Yanagisawa, Masahiro, 4,390,562, Cl. 427-11.000.
Nippon Electric Glass Company, Limited: *See*—
Daiku, Nobutaka, 4,390,637, Cl. 501-64.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Niimi, Koji; and Kawakami, Fukushi, 4,389,892, Cl. 73-586.000.
Nippon Jidoh Seiki Kabushiki Kaisha: *See*—
Nagata, Takao; and Rokutanbo, Yoshiyuki, 4,390,388, Cl. 156-351.000.
Nippon Kogaku K. K.: *See*—
Mori, Ikuo, 4,390,252, Cl. 350-471.000.
Suwa, Kyoichi, 4,390,279, Cl. 356-401.000.
Nippon Kogaku K.K.: *See*—
Nohda, Masao; Umemura, Izumi; and Arai, Toshiyuki, 4,390,255, Cl. 351-212.000.
Takemae, Mikio; and Ohkubo, Yuji, 4,390,259, Cl. 354-34.000.
Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Shimizu, Isoo; and Takahashi, Naoya, 4,390,194, Cl. 282-27.500.
Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, 4,390,000, Cl. 123-549.000.
Nippon Thompson Co., Ltd.: *See*—
Mottate, Tatsuo, 4,390,215, Cl. 308-6.00C.
Nippondenso Co., Ltd.: *See*—
Kataoka, Masami; and Higo, Nobumasa, 4,389,902, Cl. 73-861.770.
Takeuchi, Hidetsugu; Muramatsu, Tsuyoshi; and Kato, Shozo, 4,389,871, Cl. 72-356.000.
Tokitsu, Naoki, 4,390,905, Cl. 360-2.000.
Nisen, Daniel B.: *See*—
Lacy, Lewis L.; Robinson, Michael B.; Rathz, Thomas J.; Katz, Lester; and Nisen, Daniel B., 4,389,904, Cl. 73-863.110.
Nishida, Takashi: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.
Nishikawa, Masahiko; Ishibashi, Hiroaki; and Furukawa, Hidenori, to Chisso Corporation. Process for preparing porous spherical cellulose particles. 4,390,691, Cl. 536-65.000.
Nishimura, Sanji: *See*—
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,390,508, Cl. 423-112.000.
Nissan Chemical Industries, Ltd.: *See*—
Taniguchi, Tokuyuki; Yashima, Iwao; Ota, Masanori; and Sasahara, Hitoshi, 4,390,339, Cl. 8-94.180.
Nissan Motor Company, Limited: *See*—
Fujikawa, Tadashi; and Goto, Masami, 4,390,128, Cl. 239-284.00A.
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.

Nissen, Warren I.; and Petrillo, Richard J., to Gillette Company, The. Shaving implement. 4,389,773, Cl. 30-50.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Watanabe, Ichiro; Enomoto, Kanehiko; and Ogawa, Yasuo, 4,390,631, Cl. 435-244.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.
Nitzberg, Leonard R. Machine for mining thin seamed hard material in-situ between adjacent auger holes. 4,390,212, Cl. 299-57.000.
Niwa, Susumu, to Kabushiki Kaisha Hosokawa Yoko. Heat-sealing sheet material. 4,390,552, Cl. 426-126.000.
NL Sperry-Sun, Inc.: *See*—
Shawhan, Elbert N., 4,390,975, Cl. 367-82.000.
Noble, Milton L.; and Hoefer, William G., to United States of America, Air Force. Scan corrected vidicon camera apparatus. 4,390,816, Cl. 315-370.000.
Noguchi, Hiroshi: *See*—
Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, 4,390,535, Cl. 424-246.000.
Nohda, Masao; Umemura, Izumi; and Arai, Toshiyuki, to Nippon Kogaku K.K. Eye-refractometer device. 4,390,255, Cl. 351-212.000.
Noisier, Guy, to Societe Industrielle de Brevets et D'Etudes (SIBE). Carburettors with acceleration pump. 4,390,480, Cl. 261-34.00A.
Nomode Incorporated: *See*—
Webster, David F., 4,389,782, Cl. 33-1.0BB.
Nomura, Hiroyuki: *See*—
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.
Nomura, Ken: *See*—
Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, 4,390,000, Cl. 123-549.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Kristinsson, Sigurdur; and Johannesson, Orn, 4,389,750, Cl. 17-63.000.
Normann, Richard W.: *See*—
Niles, Paul D.; and Normann, Richard W., 4,390,221, Cl. 339-17.00M.
Noro, Shuhei; and Naito, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for determining an abnormality in a valve actuating system of an internal combustion engine. 4,389,882, Cl. 73-118.000.
North American Philips Consumer Electronics Corp.: *See*—
Mitchell, Robert B.; and Swank, Harry R., 4,390,809, Cl. 313-482.000.
North American Philips Corporation: *See*—
Ophir, Jonathan; and Maklad, Nabil F., 4,389,893, Cl. 73-599.000.
Northcote, Reginald D., to Parkinson Cowan GWB Limited. Grates. 4,389,978, Cl. 122-4.00D.
Northern Telecom, Inc.: *See*—
Suffi, Louis; Golden, James E.; and Burtelson, Frederick W., 4,390,744, Cl. 174-41.000.
Northern Telecom Limited: *See*—
Bond, John A.; Li, Yuan-Lu; and Crane, Leslie J., 4,390,898, Cl. 358-119.000.
Norton, Christopher W.: *See*—
Norton, Leo A.; and Norton, Christopher W., 4,389,799, Cl. 37-2.00R.
Norton, Leo A.; and Norton, Christopher W., to Lyndale Holdings Limited. Scrub crusher. 4,389,799, Cl. 37-2.00R.
Noshiro, Makoto: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.
Novak, Milan, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources. Shock-absorbing animal trap. 4,389,807, Cl. 43-96.000.
Novak, Peter: *See*—
Briner, Emil; Novak, Peter; Tanner, Bruno; and Gasser, Hermann, 4,389,840, Cl. 57-267.000.
Novak, Thaddeus. Animal feeding apparatus. 4,389,976, Cl. 119-62.000.
NRM Corporation: *See*—
Singh, Anand P.; and Shichman, Daniel, 4,390,334, Cl. 425-28.00R.
NSK-Warner K.K.: *See*—
Takagi, Masayuki, 4,390,143, Cl. 242-107.40A.
Nuovo Pignone S.p.A.: *See*—
Corain, Luciano, 4,390,044, Cl. 139-98.000.
Nussbaum, Marvin L.; and Knaggs, Edward A., to Stepan Chemical Company. Sulfonation petroleum composition. 4,390,474, Cl. 260-505.00R.
NWL Transformers: *See*—
Laugesen, Thomas C., 4,390,830, Cl. 323-237.000.
Nygren, Robert S.: *See*—
Merk, Wolfgang; Wagner, Rudolf M.; Werle, Peter; and Nygren, Robert S., 4,390,732, Cl. 568-648.000.
Obase, Hiroyuki: *See*—
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,390,536, Cl. 424-246.000.
Oberg, Lars G., to Dynatrans AB. Container truck for lifting and carrying away a container. 4,390,314, Cl. 414-547.000.
Obermeier, Manfred: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.
Oberstrass, Detley, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting apparatus. 4,389,841, Cl. 57-340.000.
O'Brien, Kirk G.; and DeBrita, John A., to General Electric Company. Dynamoelectric machine rotors with mechanical separators. 4,390,806, Cl. 310-261.000.
O'Brien, Robert E.; and Tzodikov, Nathan R., to New England Nuclear Corporation. Method, composition and kit for stabilizing radiolabeled compounds. 4,390,517, Cl. 424-1.000.
Occidental Chemical Corporation: *See*—
McKaveney, James P., 4,390,458, Cl. 252-503.000.
Occidental Research Corp.: *See*—
DiGiacomo, Peter M.; and Dines, Martin B., 4,390,690, Cl. 528-395.000.
Hard, Robert A.; and Prieto, Martin A., 4,390,365, Cl. 75-84.400.
Ochi, Kiyoyuki: *See*—
Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, to Asahi Glass Company Ltd. Process for producing SF_6 through SF_5Cl. 4,390,511, Cl. 423-469.000.
Odman, Rolf R., to Luossavaara-Kiirunavaara Aktiebolag. Heat exchanger. 4,389,796, Cl. 34-168.000.
Officine Meccaniche Mario Riboldi S.N.C. di Renato, Carlo Riboldi & C.: *See*—
Riboldi, Renato, 4,389,874, Cl. 72-389.000.
Ofuji, Hiroshi. Shotgun cartridge. 4,389,939, Cl. 102-458.000.
Ogawa, Yasuo: *See*—
Watanabe, Ichiro; Enomoto, Kanehiko; and Ogawa, Yasuo, 4,390,631, Cl. 435-244.000.
Ogawa, Yukio: *See*—
Hirohata, Michio; Ogawa, Yukio; and Taguchi, Tetsuya, 4,390,262, Cl. 354-230.000.
Ogita, Yasuhiro; Kawasaki, Kazuya; Nagao, Kouichi; and Mori, Naoki, to Tokyo Shibaura Denki Kabushiki Kaisha. High speed freezing system for a refrigerator. 4,389,854, Cl. 62-157.000.
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Takemae, Mikio; and Ohkubo, Yuji, 4,390,259, Cl. 354-34.000.
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Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Morita, Satoshi, 4,390,737, Cl. 568-804.000.
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Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; and Iwasaki, Syunji, 4,390,747, Cl. 179-1.0SC.
Ohtsu, Masamitsu: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Taniguchi, Hiroshi; Kubo, Kanji; and Ohtsu, Masamitsu, 4,390,906, Cl. 360-19.100.
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Okada, Saburo, 4,389,776, Cl. 30-162.000.
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Okano, Michiaki; and Furuichi, Shuhei, to Kabushiki Kaisha Morita Seisakusho. Occlusion pressure sensor. 4,390,028, Cl. 128-777.000.
O'Keefe, David F.: *See*—
Holan, George; and O'Keefe, David F., 4,390,715, Cl. 424-282.000.

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Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.
Okouchi, Isao: *See—*
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Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, 4,390,535, Cl. 424-246.000.
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Sundt, Eilert, 4,390,423, Cl. 210-222.000.
Olberding, Leonard E. Double door assembly. 4,389,817, Cl. 49-163.000.
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Sawyer, Roy T.; Stent, Gunther S.; Budzynski, Andrei Z.; and Olexa, Stephanie A., 4,390,630, Cl. 435-226.000.
Olin Corporation: *See—*
Kircher, Morton S., 4,390,408, Cl. 204-284.000.
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Lauro, Luciano, 4,390,865, Cl. 340-347.05Y.
Olmsted, James H., to McCoy Industries, Inc. Sawhorse and sawhorse kit and method of packaging thereof. 4,390,081, Cl. 182-151.000.
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Olson, John H.; and Schlaufman, Robert J., to Corning Glass Works. Laminated gob for pressing glass articles. 4,390,593, Cl. 428-410.000.
Olson, Martin L.: *See—*
Harrison, Eugene O.; Martin, David J.; and Olson, Martin L., 4,390,017, Cl. 604-270.000.
Olympus Optical Co., Ltd.: *See—*
Imai, Toshihiro, 4,390,250, Cl. 350-465.000.
Mizokami, Kazunori, 4,390,258, Cl. 354-24.000.
Mizumoto, Morihide, 4,390,012, Cl. 128-4.000.
Musha, Toru, 4,390,781, Cl. 250-204.000.
Watanabe, Seizo, 4,390,917, Cl. 360-128.000.
Yoshinaga, Makoto, 4,390,254, Cl. 350-523.000.
O'Mara, Kerry D., to RCA Corporation. Method of making a laminated recorded disc. 4,390,487, Cl. 264-107.000.
Omark Industries, Inc.: *See—*
Hutson, Marvin R.; and Dutmers, Louis G., 4,390,132, Cl. 241-55.000.
Omron Tateisi Electronics Co.: *See—*
Kawashima, Keisuke; Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, 4,390,966, Cl. 364-900.000.
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, to Kuraray Co., Ltd. 2,2-Dimethyl-3-(substituted ethyl)cyclopropane carboxylate pesticidal compositions and methods. 4,390,547, Cl. 424-304.000.
OMYA GmbH: *See—*
Barthelmess, Ulrich, 4,390,419, Cl. 209-11.000.
O'Neal, Larry. Inflatable dock seal. 4,389,821, Cl. 52-2.000.
O'Neill, Michael J.; and Hill, Harold I., to Perkin-Elmer Corporation, The. Temperature sensor for a resistance furnace. 4,390,290, Cl. 374-142.000.
O'Neill, Padraic S.: *See—*
Weston, Charles W.; and O'Neill, Padraic S., 4,390,509, Cl. 423-313.000.
Ong, Siak H. Intake port for an internal combustion engine. 4,389,988, Cl. 123-306.000.
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Ono Pharmaceutical Co., Ltd.: *See—*
Yamato, Takashi; Endo, Hirofumi; Matsumoto, Kimiichiro; and Miyake, Hajimu, 4,390,548, Cl. 424-321.000.
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Oka, Ken-ichiro; Mineo, Masatoshi; and Ono, Terumichi, 4,390,685, Cl. 528-272.000.
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Ophir, Jonathan; and Maklad, Nabil F., to North American Philips Corporation. Precision ultrasound attenuation measurement. 4,389,893, Cl. 73-599.000.
Oppelt, Arnulf: *See—*
Ganssen, Alexander; Oppelt, Arnulf; and Loeffler, Wilfried, 4,390,840, Cl. 324-309.000.
Orangeburg Technologies, Inc.: *See—*
Burnham, Francis L., 4,390,323, Cl. 417-253.000.
O'Rear, Dennis J.; and Mayer, Jerome F., to Chevron Research Company. Hydrocarbon upgrading process. 4,390,413, Cl. 208-61.000.
Ormond, A. Newman. Analog to digital converter without zero drift. 4,390,864, Cl. 340-347.0NT.
Orova, Josef; Roderer, Herbert; Schmid, Hans D.; and Steffen, Horst-G., to Robert Bosch GmbH. Magneto generator for ignition systems. 4,390,804, Cl. 310-70.00R.
Ortho Diagnostics, Inc.: *See—*
Lombardo, Igino; and Natale, Peter J., 4,390,484, Cl. 264-9.000.
Orthoefer, Frank T.: *See—*
Gibson, Paul W.; and Orthoefer, Frank T., 4,390,450, Cl. 252-307.000.
Osaka, Hiroshi; and Honma, Akira, to Clarion Co., Ltd. Television signal processing system. 4,390,899, Cl. 358-120.000.
Ostler, Charles R.; and Hampton, William A., to Container Corporation of America. Corrugated paperboard pallet deck. 4,390,154, Cl. 248-346.000.
Ostroski, Richard J.; Aberer, James B.; and Best, Gary, to Rival Manufacturing Company. Bag opening device for can openers. 4,389,780, Cl. 30-408.000.
Oswald, Alexis A., to Exxon Research and Engineering Co. Process for carbonylation using tetraalkyl phosphonium substituted phosphine and amine transition metal complexes as catalyst. 4,390,729, Cl. 568-454.000.
Ota, Masanori: *See—*
Taniguchi, Tokuyuki; Yashima, Iwao; Ota, Masanori; and Sasahara, Hitoshi, 4,390,339, Cl. 8-94.180.
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isao, to Hitachi, Ltd. Method of monitoring condenser performance and system therefor. 4,390,058, Cl. 165-1.000.
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Nasuno, Toshihiro; and Otoi, Kiyoshi, 4,390,524, Cl. 424-63.000.
Ott, Hans: *See—*
Celio, Tino; and Ott, Hans, 4,390,280, Cl. 356-445.000.
Oughton, Richard W., to Du Pont Canada Inc. Control of residual solvent in oat products. 4,390,469, Cl. 260-123.500.
Ouwerkerk, Anton V.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.
Ouwerkerk, Johannes H. W.: *See—*
Cramer, Rudolph E.; and Ouwerkerk, Johannes H. W., 4,390,346, Cl. 48-180.00R.
Overbury, Douglas G.; and McDougall, Robert J., to Black & Decker Inc. Ribbed handle and guard construction for chain saw. 4,389,779, Cl. 30-382.000.
Oy Lohja AB: *See—*
Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., 4,389,973, Cl. 118-725.000.
Oy Wartsila Oy: *See—*
Flander, Walter; Leikas, Jukka; and Hirvonen, Vesa, 4,389,764, Cl. 29-416.000.
Oyama, Hiroshi: *See—*
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,389,738, Cl. 4-420.200.
Oyobe, Isao: *See—*
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Oziomek, James: *See—*
Lee, Kang I.; and Oziomek, James, 4,390,673, Cl. 526-212.000.
Ozite Corporation: *See—*
Pickens, Robert C., Jr.; Thomas, Reese R.; and Ellicson, John W., 4,390,582, Cl. 428-85.000.
P. A. Rentrop, Hubbert & Wagner Fahrzeugausstattungen GmbH & Co.: *See—*
Pickelscher, Kurt G., 4,390,328, Cl. 418-45.000.
Pakkala, Arto J.: *See—*
Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., 4,389,973, Cl. 118-725.000.
Palm, Bengt A., to Alfa-Laval AB. Sterilization of bacterial concentrates. 4,390,350, Cl. 55-38.000.
Palmer, James K.: *See—*
Long, James C.; and Palmer, James K., 4,389,898, Cl. 73-861.120.
Panttaja, Swen A. Herbicide wand and method for making. 4,389,812, Cl. 47-1.500.
Papageorges, Georges: *See—*
De Ceuster, Jean; and Papageorges, Georges, 4,390,395, Cl. 162-5.000.
Paper, Calmenson & Co.: *See—*
Wright, Richard E., 4,390,071, Cl. 172-701.300.
Paquette, Gerard A. Fuel preheater. 4,390,007, Cl. 126-350.00R.
Paradyne Corporation: *See—*
Betts, William L.; and Martinez, Kenneth, 4,390,843, Cl. 328-138.000.
Parasuraman, Balakrishna: *See—*
Wood, Leonard J.; Parasuraman, Balakrishna; Williams, Edwin H.; Alexander, Mark G.; and Montgomery, Richard C., Jr., 4,390,981, Cl. 370-56.000.
Parish, John R. Self-collapsible, inflatable device. 4,389,961, Cl. 114-345.000.
Parish, Max M. Practice pitching apparatus. 4,390,181, Cl. 273-26.00A.
Parker, Stephen J.: *See—*
Courtney, Robert W.; Parker, Stephen J.; and Threadgold, Alan C., 4,390,615, Cl. 430-315.000.
Parkinson Cowan GWB Limited: *See—*
Northcote, Reginald D., 4,389,978, Cl. 122-4.00D.
Pashoogian, Michael: *See—*
Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, 4,390,039, Cl. 137-315.000.
Patel, Parsotam T.: *See—*
Bergeron, David L.; and Patel, Parsotam T., 4,390,890, Cl. 357-44.000.
Patton, John T.; and Canfield, Carl M., to Champlin Petroleum Company. Carbon dioxide stimulated oil recovery process. 4,390,068, Cl. 166-267.000.
Patzke, Jorg: *See—*
Weise, Carlos; Wolfer, Dietrich; and Patzke, Jorg, 4,390,656, Cl. 524-493.000.

Paul Revere Corporation, The: *See—*
Kluver, Leroy; and Arnold, John, 4,389,929, Cl. 100-88.000.
Rutschilling, Paul C., 4,389,930, Cl. 100-88.000.
Paulve, Marcel L. A. Undergrowth crusher. 4,390,134, Cl. 241-101.200.
Pav, Josef, to Kleinewefers GmbH. Calender with composite outermost rolls. 4,389,932, Cl. 100-162.00B.
Pav, Josef, to Kleinewefers GmbH. Calender. 4,389,933, Cl. 100-162.00B.
Payette, Lionel J.: *See—*
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., 4,390,590, Cl. 428-383.000.
Peake, Steven L., to American Cyanamid Company. Bis-thioalkylfurans useful as cyclopentenone prostaglandin intermediates. 4,390,707, Cl. 549-214.000.
Pearson, Erik W., to Superscope, Inc. Noise control system for FM radio. 4,390,749, Cl. 179-1.0GJ.
Pearson, James E., to United Technologies Corporation. Adaptive laser output coupler. 4,390,991, Cl. 372-21.000.
Pearson, Richard W. Apparatus and method for monitoring periodic dispensation of pills. 4,389,963, Cl. 116-308.000.
Peck, Alan M.; Tutt, Kingsley J.; and Mansfield, Graham J., to USM Corporation. Machine adapted for use in the manufacture of shoes. 4,389,861, Cl. 69-6.500.
Peck, John H., to United States of America, Army. Ammunition belt feed magazine system. 4,389,918, Cl. 89-34.000.
Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., to Peck, Richard M. Color facsimile printing device comprising photosensitive ink in pores. 4,390,614, Cl. 430-252.000.
Pecoraro, Theresa A.: *See—*
Chianelli, Russell R.; and Pecoraro, Theresa A., 4,390,514, Cl. 423-509.000.
Peczkowski, Jurgen: *See—*
Linssen, Mathias; and Peczkowski, Jurgen, 4,390,130, Cl. 239-585.000.
Peek, Sanford C., to GTE Laboratories Incorporated. Lighting apparatus. 4,390,814, Cl. 315-320.000.
Pehrson, Jens E., to Telefonaktiebolaget L M Ericsson. Method and an arrangement for supervising faults when transmitting data between computers. 4,390,989, Cl. 371-22.000.
Pelliccia, Raymond A. Vibration sensor and electrical power shut off device. 4,390,922, Cl. 361-170.000.
Peppers, James M.: *See—*
Bigham, Bobby J., 4,390,115, Cl. 222-326.000.
Perbet, Jean Noel: *See—*
Hareng, Michel; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean Noel, 4,390,244, Cl. 350-333.000.
Perera, Slobodan R.: *See—*
Hertrich, Friedrich R.; and Perera, Slobodan R., 4,390,912, Cl. 360-78.000.
Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,389,982, Cl. 123-73.00R.
Pergler, Charles C.: *See—*
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.
Perkin-Elmer Corporation, The: *See—*
La Fiandra, Carlo F., 4,390,929, Cl. 362-216.000.
O'Neill, Michael J.; and Hill, Harold I., 4,390,290, Cl. 374-142.000.
Perkins, Lawrence B., to W. T. Fail, Inc., a part interest. Gas regulation device for gas actuated valves. 4,390,037, Cl. 137-240.000.
Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company, The. Upgrading synthesis gas. 4,390,639, Cl. 518-713.000.
Peters, Thomas E.; and McColl, James R., to GTE Laboratories Incorporated. Method of preparing stoichiometric zinc silicate phosphor with improved brightness and persistence. 4,390,449, Cl. 252-301.60F.
Peterson Manufacturing Co.: *See—*
Slater, Charles A., Jr.; and Darby, Spencer A., 4,390,936, Cl. 362-390.000.
Petrillo, Richard J.: *See—*
Nissen, Warren I.; and Petrillo, Richard J., 4,389,773, Cl. 30-50.000.
Petron, Darlene M. Mail sorter with an expandable bellows binding. 4,390,100, Cl. 211-10.000.
Pfenninger, Heinz: *See—*
Bruttel, Beat; and Pfenninger, Heinz, 4,390,342, Cl. 8-524.000.
Pfizer Inc.: *See—*
Walinsky, Stanley W., 4,390,670, Cl. 526-79.000.
Weeks, Paul D.; and Allingham, Robert P., 4,390,709, Cl. 549-418.000.
Phelan, Charles M., to Globe Oil Tools, Inc. Drill bit lubricant circulation system. 4,390,072, Cl. 175-229.000.
Philip Morris Incorporated: *See—*
Gonzalez, Hector M., 4,390,091, Cl. 198-358.000.
Phillips, Charles E.: *See—*
Bjorklund, Glenn J.; and Phillips, Charles E., 4,390,876, Cl. 340-825.170.
Phillips Petroleum Company: *See—*
DeShon, Wallace E., 4,390,947, Cl. 364-200.000.
Scinta, James; and Hart, Peter J., 4,390,411, Cl. 208-11.0LE.
Stacy, Carl J., 4,390,648, Cl. 523-216.000.
Photax (London) Ltd.: *See—*
Dunn, Sidney R., 4,389,803, Cl. 40-361.000.
Phung, Nhu H.: *See—*
Amigues, Pierre; Chauvin, Yves; Commereuc, Dominique; Gaillard, Jean; and Phung, Nhu H., 4,390,431, Cl. 210-724.000.
Phy, William S., to Fairchild Camera & Instrument Corp. Lead format for tape automated bonding. 4,390,598, Cl. 428-577.000.
Physical Systems, Inc.: *See—*
Hutter, Charles G., III, 4,390,576, Cl. 428-40.000.
Piana, Giuseppe S., to UNOPER S.r.l. Beverage extracting and dispensing machine. 4,389,925, Cl. 99-289.00R.
Picavet, Rudolf P. Alternating rotor motor with rotor positioning sensors. 4,390,327, Cl. 418-35.000.
Pickens, Robert C., Jr.; Thomas, Reese R.; and Ellicson, John W., to Ozite Corporation. Cut pile fabric with carrier and texturized loops. 4,390,582, Cl. 428-85.000.
Pickrel, Jack D. Method of and apparatus for comminuting material. 4,390,131, Cl. 241-1.000.
Pierrel, S.p.A.: *See—*
Riva, Mario; and Toscano, Luciano, 4,390,533, Cl. 424-243.000.
Pierresteguy, Jean-Francois J. Distribution frame. 4,390,755, Cl. 179-98.000.
Pirro, Armand, to Cosco, Inc. (Tucker Housewares Div.). Handle interlock for a trash can lid. 4,390,110, Cl. 220-318.000.
Pitney Bowes Inc.: *See—*
Dlugos, Daniel F., 4,390,952, Cl. 364-464.000.
Player, Wayne H., to Howmet Aluminum Corporation. Modular roof skylight. 4,389,823, Cl. 52-200.000.
Plough, Inc.: *See—*
Quick, Timothy W., 4,390,442, Cl. 252-106.000.
Ploumen, Hubert J., to Hollandse Signaalapparaten B.V. Power supply circuit. 4,390,896, Cl. 358-73.000.
Plyler, Robert G.; and Suverison, Lyle B., to General Motors Corporation. Blade terminal with protected latch tangs. 4,390,231, Cl. 339-217.00S.
Podell, Jack; and Haner, Douglas, to SB/JP Enterprises, Inc. Bolt-together building set for children. 4,389,808, Cl. 46-16.000.
Pohlmann, Klaus-Dieter: *See—*
Becker, Kunibert; Kirchbrucher, Rudiger; Lagodka, Gunter; and Pohlmann, Klaus-Dieter, 4,390,308, Cl. 405-299.000.
Poikonen, Jorma: *See—*
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Polaroid Corporation: *See—*
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,390,613, Cl. 430-219.000.
Poliniak, Eugene S.: *See—*
Datta, Pabitra; and Poliniak, Eugene S., 4,390,579, Cl. 428-65.000.
Pollack, Jeremy D., to RCA Corporation. Carriage translating mechanism for video disc player. 4,390,978, Cl. 369-220.000.
Polyplastics Co., Ltd.: *See—*
Komazawa, Hiroyasu; Mori, Tadashi; Ikenaga, Yukio; Hotta, Hiroshi; and Nakashima, Tuneyasu, 4,390,684, Cl. 528-230.000.
Pomeroy, Keith H., to American Hoechst Corporation. Imaging system and method with mid-tone enhancement. 4,390,903, Cl. 358-282.000.
Pomranky, George J.: *See—*
Clarke, Donald H.; Pomranky, George J.; and Schmidt, Donald L., 4,390,644, Cl. 521-121.000.
Popperling, Rolf: *See—*
Niehaus, Norbert; Popperling, Rolf; and Bester, Horst, 4,390,367, Cl. 75-125.000.
Porter, Donald G. Fan accessory for heater. 4,390,005, Cl. 126-110.00B.
Porter, Stephen C.: *See—*
Quackenbush, William L.; Porter, Stephen C.; and Cargile, William P., 4,390,944, Cl. 364-200.000.
Poteiko, Andrei I.: *See—*
Khusnutdinov, Gil D.; Chernovol, Arkady V.; Shumikhin, Vladimir S.; Shulga, Vasily T.; Poteiko, Andrei I.; Kamensky, Vladimir K.; Kondakov, Jury A.; and Shmigidin, Viktor G., 4,390,362, Cl. 75-49.000.
PPG Industries, Inc.: *See—*
Ernsberger, Fred M., 4,390,592, Cl. 428-410.000.
Girgis, Mikhail M., 4,390,647, Cl. 523-212.000.
Loehr, Clifford E.; Crawford, Roger A.; Carbaugh, John E.; and Welch, Cletus N., 4,390,512, Cl. 423-474.000.
Manner, James A., 4,390,710, Cl. 549-441.000.
Prasad, Christopher: *See—*
Enga, Bernard E.; and Prasad, Christopher, 4,389,983, Cl. 123-143.00B.
Precision Screen Machines, Inc.: *See—*
Jaffa, David; and Szarka, Sandor, 4,389,936, Cl. 101-123.000.
Preiss, Martin D.; and Students, Peter A., to Cardox Corporation. Apparatus for preventing snow buildup in a carbon dioxide snow cyclone separator. 4,390,356, Cl. 62-35.000.
Presco, Inc.: *See—*
Gotman, Alexander, 4,390,172, Cl. 269-56.000.
President and Fellows of Harvard College: *See—*
Goldberg, Alfred L.; Swamy, K. H. Sreedhara; and Chung, Chin H., 4,390,629, Cl. 435-220.000.
Presto Lock, Inc.: *See—*
Bako, Lazlo, 4,389,863, Cl. 70-312.000.
Preston, Edward G.: *See—*
Labbe, Francis A. M.; and Preston, Edward G., 4,390,032, Cl. 131-281.000.
Prieto, Martin A.: *See—*
Hard, Robert A.; and Prieto, Martin A., 4,390,365, Cl. 75-84.400.
Prince Corporation: *See—*
Flowerday, Carl; Marcus, Konrad H.; Kempkers, Gordon; Boerema, Edward T.; and Fleming, Dennis J., 4,390,202, Cl. 296-97.00K.
Prinz, Reinhard, to Zeiss-Stiftung, Carl. Play control for a threaded drive. 4,390,260, Cl. 354-65.000.

Prober, James M.: *See*—
Faulhaber, Mark E.; and Prober, James M., 4,390,785, Cl. 250-330.000.

Procter & Gamble Company, The: *See*—
Blair, Daniel R.; Lomneth, Richard B.; Prosise, Robert L.; and Tao, Bernard T., 4,390,561, Cl. 426-607.000.

Produktutvecklingscentrum i Goteborg: *See*—
Kardos, Karl; Mattsson, Bertil; and Westermark, Olle, 4,390,004, Cl. 126-104.00A.

Prosise, Robert L.: *See*—
Blair, Daniel R.; Lomneth, Richard B.; Prosise, Robert L.; and Tao, Bernard T., 4,390,561, Cl. 426-607.000.

Przemyslowy Instytut Automatyki i Pomiarow "MERA-PIAP": *See*—
Kolodziejski, Stanislaw; Dwojak, Stanislaw; and Grabowski, Andrzej, 4,389,897, Cl. 73-861.000.

PTX-Pentronix, Inc.: *See*—
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,390,335, Cl. 425-78.000.

Puffer, Herbert J., Jr.: *See*—
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,390,335, Cl. 425-78.000.

Puhl, Larry C.; and Kasley, Paul A., to Motorola, Inc. Interface adapter architecture. 4,390,963, Cl. 364-900.000.

Purdue Research Foundation: *See*—
Martin, Harry L.; and Goodson, Raymond E., 4,390,841, Cl. 324-427.000.

Quackenbush, William L.; Porter, Stephen C.; and Cargile, William P., to BTI Computer Systems. System for controlling access to a common bus in a computer system. 4,390,944, Cl. 364-200.000.

Quaker Oats Company, The: *See*—
Lemmeyer, Gary R., 4,390,381, Cl. 156-63.000.

Quaranti, Giovanni: *See*—
Gubau, Giuseppe; Roano, Domenico; and Quaranti, Giovanni, 4,390,293, Cl. 400-144.200.

Queren, James. Burglar alarm system. 4,390,867, Cl. 340-542.000.

Quick, Timothy W., to Plough, Inc. Non-stinging eye make-up remover composition. 4,390,442, Cl. 252-106.000.

Quinn, Bernard W., to McDonnell Douglas Corporation. Flat sheet scatterometer. 4,390,277, Cl. 356-371.000.

Qvarnstrom, Bengt G. L.: *See*—
Andreason, Gustav O.; Friberg, Ulf R.; Kuvaja, Heimo H.; and Qvarnstrom, Bengt G. L., 4,389,814, Cl. 47-73.000.

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Heikel, Rodney W., 4,390,779, Cl. 377-6.000.

Racine Federated Inc.: *See*—
Lake, Jack E., 4,389,901, Cl. 73-861.580.

Rains, Randall C.: *See*—
Hoffman, Dwight K.; Harris, Robert F.; Tefertiller, Nancy B.; and Rains, Randall C., 4,390,645, Cl. 521-137.000.

Rasshofer, Werner; Avar, Geza; Freitag, Hans-Albrecht; Grogler, Gerhard; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the production of optionally-foamed polyurethanes. 4,390,640, Cl. 521-51.000.

Rastogi, Prahbat K., to Inland Steel Company. Method for producing medium silicon steel electrical lamination strip. 4,390,378, Cl. 148-111.000.

Rathz, Thomas J.: *See*—
Lacy, Lewis L.; Robinson, Michael B.; Rathz, Thomas J.; Katz, Lester; and Nisen, Daniel B., 4,389,904, Cl. 73-863.110.

Ratliff, Charles R.: *See*—
Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., 4,390,885, Cl. 346-140.00R.

Ratzlaff, Howard J.: *See*—
Garrison, Harold K.; and Ratzlaff, Howard J., 4,390,092, Cl. 198-638.000.

Raven, Johannes G., to U.S. Philips Corporation. Noise suppression circuit for a video signal. 4,390,894, Cl. 358-36.000.

Ravenelle, Charles I.: *See*—
Bowden, Larry D.; Miyashita, Albert H.; and Ravenelle, Charles I., 4,390,610, Cl. 430-58.000.

Raychem Corporation: *See*—
Broyles, Harry C., 4,390,599, Cl. 428-597.000.

Raychem GmbH: *See*—
Bottcher, Bodo K.; and Wilck, Manfred O., 4,390,745, Cl. 174-73.00R.

Raytheon Company: *See*—
Schmoock, James C., 4,390,799, Cl. 307-310.000.
Teich, Wesley W.; and Dudley, Kenneth W., 4,390,768, Cl. 219-10.55B.
Trembly, Gray C.; Goldberg, Ernest; and Dragun, Edward B., 4,389,940, Cl. 102-439.000.

RCA Corporation: *See*—
Babcock, William E.; and Wendt, Frank S., 4,390,819, Cl. 315-411.000.
Banks, Arthur J., 4,390,892, Cl. 358-17.000.
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., 4,390,902, Cl. 358-192.100.
Clark, Charles A., Jr., 4,390,937, Cl. 363-22.000.
Datta, Pabitra; and Poliniak, Eugene S., 4,390,579, Cl. 428-65.000.
Key, Charles W.; and Christensen, Edward W., II, 4,390,815, Cl. 315-368.000.
O'Mara, Kerry D., 4,390,487, Cl. 264-107.000.
Pollack, Jeremy D., 4,390,978, Cl. 369-220.000.
Willis, Donald H., 4,390,820, Cl. 315-411.000.

Reagan, Larry: *See*—
Berk, Donald M.; Jacoby, Charles E.; and Reagan, Larry, 4,389,941, Cl. 104-49.000.

Recaro GmbH & Co.: *See*—
Resag, Jorg; Goldner, Walther; and Treiber, Horst, 4,390,207, Cl. 297-362.000.

Redifon Simulation Limited: *See*—
Lobb, Daniel R., 4,390,253, Cl. 350-505.000.

Reed, Norman L. Valves for pressurized dispensing containers. 4,390,160, Cl. 251-149.600.

Reederei und Spedition "Braunkohle" GmbH: *See*—
Beyen, Heinrich, 4,390,040, Cl. 137-340.000.

Reeves, Jeffrey R., to TRW, Inc. Method of making a trimmer capacitor. 4,389,762, Cl. 29-25.420.

Regaldo, Pietro. Plant composed of multi-functional apparatus for delivering substances for treating roadways or the land, and which can be self-loaded from the ground on to the platform of a transporter vehicle, and vice versa. 4,390,286, Cl. 366-186.000.

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Louis, Llorente, 4,390,205, Cl. 297-129.000.

Rehberg, Irene L., to Elastic Coating Systems, Inc. Fluid roof system. 4,390,570, Cl. 427-385.500.

Reif, Robert B.: *See*—
Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., 4,390,614, Cl. 430-252.000.

Reinke, Nelson A.; and Ulch, B. G. Air-circulating assembly. 4,390,060, Cl. 165-76.000.

Reip, Raymond G., to Vapor Corporation. Pilot operated relief valve. 4,390,041, Cl. 137-488.000.

Reliance Electric Company: *See*—
Baumbach, Bertram W., 4,390,921, Cl. 361-119.000.

Remington Arms Company, Inc.: *See*—
Kast, Jack L.; Eddy, Albert R.; and Carter, Merle F., 4,389,919, Cl. 89-185.000.

Resag, Jorg; Goldner, Walther; and Treiber, Horst, to Recaro GmbH & Co. Bucket seat. 4,390,207, Cl. 297-362.000.

Research Corporation: *See*—
Najjar, Victor A., 4,390,528, Cl. 424-177.000.

Research-Cottrell, Inc.: *See*—
Byrd, William; and Kohke, Stephen J., 4,390,831, Cl. 323-240.000.

Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Alkyl-ω-fluoroformyl ester and process. 4,390,720, Cl. 560-184.000.

Reunamaki, Pauli, to Tamglass Oy. Method of and apparatus for preventing the curving of glass sheets in the roller-equipped furnace of a horizontal tempering plant. 4,390,359, Cl. 65-114.000.

Reuter, Hans-Josef, to Mecan Arbed S.A. Curved continuous-casting mold and method of reestablishing the internal dimensions thereof. 4,390,057, Cl. 164-459.000.

Reynolds, Elizabeth B.: *See*—
Franz, Norman J.; and Reynolds, Elizabeth B., 4,389,734, Cl. 2-59.000.

Reynolds Manufacturing Company: *See*—
Goby, Larry G., 4,389,800, Cl. 37-124.000.

Reynolds Metals Company: *See*—
Dunn, Wendell E., Jr., 4,390,400, Cl. 204-67.000.

Rhone-Poulenc Agrochimie: *See*—
Fahmy, Mohamed A., 4,390,529, Cl. 424-220.000.

Rhone-Poulenc Industries: *See*—
Chauvel, Bernard, 4,390,597, Cl. 428-512.000.
Laurent, Serge, 4,390,596, Cl. 428-473.500.
Williamson, John P. H.; and Moilliet, John L., 4,389,819, Cl. 51-317.000.

Riboldi, Renato, to Officine Mecchaniche Mario Riboldi S.N.C. di Renato, Carlo Riboldi & C. Bending brake. 4,389,874, Cl. 72-389.000.

Rice, Alan R. Pile-driving apparatus. 4,390,307, Cl. 405-228.000.

Rice, Stanley: *See*—
Myers, Daryl L.; and Rice, Stanley, 4,390,357, Cl. 65-2.000.

Rich, Alexander: *See*—
Gorecki, Marian; Acquaye, Clemenceau T. A.; Wilchek, Meir; and Rich, Alexander, 4,390,526, Cl. 424-177.000.

Rich Products Corporation: *See*—
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,390,550, Cl. 426-102.000.

Richardson, Charles N., to Tri-State Oil Tool Industries, Inc. Apparatus for well treating. 4,390,065, Cl. 166-181.000.

Richardson, Keith C.: *See*—
Long, Emile D.; and Richardson, Keith C., 4,389,993, Cl. 123-421.000.

Richter Gedeon Vegyeszeti Gyar RT: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.

Ricoh Company, Ltd.: *See*—
Hashimoto, Mitsuru; Sasaki, Masaomi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, heir, 4,390,608, Cl. 430-57.000.
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Iijima, Takeshi, 4,389,972, Cl. 118-691.000.
Kato, Toshifumi, 4,390,176, Cl. 271-270.000.

Ridgway, Frank; and Woolfenden, Richard D. G., to E. R. Squibb & Sons, Inc. Stabilization of pleuromutilin derivatives against oxidation by sodium hypochlorite in aqueous solution. 4,390,558, Cl. 426-541.000.

Rieben, Stuart L.: *See*—
Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,390,042, Cl. 138-89.000.

Riede, Gerhard, to Gambro AG. Device for diffusing matter between two fluids via semi-permeable diaphragms. 4,390,424, Cl. 210-232.000.
Rieger, Hansjorg; and Holzwarth, Dietmar, to RUD-Kettenfabrik Rieger 6 Dietz GmbH u. Co. Anti-slip chain for vehicle tires. 4,390,053, Cl. 152-213.00A.
Riess, Gordon S., to Temp-Trak Inc. Prefillable hypodermic syringe and method of assembling the syringe. 4,390,016, Cl. 604-236.000.
Riester, William C., to Trico Products Corporation. Windshield wiper blade refill unit. 4,389,747, Cl. 15-250.420.
Rieter Machine Works Limited: *See*—
Briner, Emil; Clement, Heinz; and Eberli, Heiser, 4,389,752, Cl. 19-0.560.
Briner, Emil; Novak, Peter; Tanner, Bruno; and Gasser, Hermann, 4,389,840, Cl. 57-267.000.
Gyger, Paul; and Schar, Hugo, 4,389,751, Cl. 19-0.350.
Rietsch, Eike, to Deutsche Texaco Aktiengesellschaft. Method for determining the extent of subsurface reaction involving acoustic signals. 4,390,973, Cl. 367-40.000.
Riker Laboratories, Inc.: *See*—
Banitt, Elden H., 4,390,716, Cl. 560-65.000.
Ring Sights Limited: *See*—
Budden, Raymond G.; and Scott, Fraser, 4,390,276, Cl. 356-251.000.
Risch, Lothar; and Mader, Hermann, to Siemens Aktiengesellschaft. X-y Infrared CCD sensor and method for making same. 4,390,888, Cl. 357-30.000.
Rise, Mark T., to Medtronic, Inc. Patterned electrical tissue stimulator. 4,390,023, Cl. 128-421.000.
Ritter, Ronald E.; and Henderson, Donald S., to W. R. Grace & Co. Catalytic cracking of hydrocarbons. 4,390,416, Cl. 208-120.000.
Ritzer, Alan; Shah, Bakulesh; and Sliva, Daniel E., to General Electric Company. Process for treating spent silicon-containing reaction masses to produce halosilanes. 4,390,510, Cl. 423-342.000.
Riva, Mario; and Toscano, Luciano, to Pierrel, S.p.A. Steroids and process for preparing the same. 4,390,533, Cl. 424-243.000.
Rival Manufacturing Company: *See*—
Ostroski, Richard J.; Aberer, James B.; and Best, Gary, 4,389,780, Cl. 30-408.000.
Roano, Domenico: *See*—
Gubau, Giuseppe; Roano, Domenico; and Quaranti, Giovanni, 4,390,293, Cl. 400-144.200.
Robbins, Arthur J.; Robbins, Paul B.; and Thompson, Dennis C., to Robbins Scientific Corporation. Sealable vial. 4,390,111, Cl. 220-259.000.
Robbins, Paul B.: *See*—
Robbins, Arthur J.; Robbins, Paul B.; and Thompson, Dennis C., 4,390,111, Cl. 220-259.000.
Robbins Scientific Corporation: *See*—
Robbins, Arthur J.; Robbins, Paul B.; and Thompson, Dennis C., 4,390,111, Cl. 220-259.000.
Robert Bosch GmbH: *See*—
Denz, Helmut; Stumm, Hans-Peter; and Zechnall, Martin, 4,389,994, Cl. 123-478.000.
Fell, Wolfgang; and Sanders, Werner, 4,390,913, Cl. 360-85.000.
Koder, Manfred; and Schmid, Gunther, 4,389,883, Cl. 73-119.00R.
Kubach, Hans, 4,390,857, Cl. 335-282.000.
Kuhlmann, Gerhard, 4,390,311, Cl. 409-232.000.
Linssen, Mathias; and Peczkowski, Jurgen, 4,390,130, Cl. 239-585.000.
Meyer, Friedhelm; Kurz, Wolfgang; and Severing, Joachim, 4,390,792, Cl. 307-10.0BP.
Orova, Josef; Roderer, Herbert; Schmid, Hans D.; and Steffen, Horst-G., 4,390,804, Cl. 310-70.00R.
Roberts, James R.; McIlrath, Thomas J.; and Lucatorto, Thomas B. Laser utilizing coated, multicapillary array as output window. 4,390,994, Cl. 372-99.000.
Roberts, Stanley M., to Allen & Hanburys Limited. 3-Endo-protected hydroxyl-tricyclo[3,2,0,0^{2,7}]heptan-6-ones. 4,390,721, Cl. 560-256.000.
Robin, Allen M.: *See*—
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., 4,390,347, Cl. 48-197.00R.
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., 4,390,348, Cl. 48-197.00R.
Robinet, Alain, to Societe Nationale Elf Aquitaine (Production). Rapidly erodible sonde. 4,389,880, Cl. 73-86.000.
Robinson, John T.; Cecil, Olin B.; and Shah, Rajiv R., to Texas Instruments Incorporated. Method for removal of minute physical damage to silicon wafers by employing laser annealing. 4,390,392, Cl. 156-643.000.
Robinson, Michael B.: *See*—
Lacy, Lewis L.; Robinson, Michael B.; Rathz, Thomas J.; Katz, Lester; and Nisen, Daniel B., 4,389,904, Cl. 73-863.110.
Robinson, Thomas C.; Kitrilakis, Sotiris; and Martin, Thomas B., Jr., to Foxcroft Associates. Hydraulically actuated cardiac prosthesis with three-way ventricular valving. 4,389,737, Cl. 3-1.700.
Rockwell International Corporation: *See*—
Beningfield, Harley W.; and Wilt, Donna F., 4,390,949, Cl. 364-429.000.
Best, David W., 4,390,987, Cl. 370-112.000.
Best, David W.; and Russell, Jeffrey D., 4,390,988, Cl. 370-113.000.
Higgins, J. Aiden; and Gupta, Aditya K., 4,390,851, Cl. 330-277.000.
Jaqua, Vance W., 4,389,999, Cl. 123-536.000.
Nebiker, Herman, Jr., 4,390,924, Cl. 361-279.000.
Tzeng, Chin-Pyng J., 4,390,833, Cl. 323-280.000.
Roderer, Herbert: *See*—
Orova, Josef; Roderer, Herbert; Schmid, Hans D.; and Steffen, Horst-G., 4,390,804, Cl. 310-70.00R.
Rodriguez, Edward T., to Theta-J Corporation. Solid state optically coupled electrical power switch. 4,390,790, Cl. 250-551.000.
Rohde, Gunter; and Kuhn, Friedrich, to J. M. Voith GmbH. Reeling apparatus for a web. 4,390,138, Cl. 242-55.000.
Rokutanbo, Yoshiyuki: *See*—
Nagata, Takao; and Rokutanbo, Yoshiyuki, 4,390,388, Cl. 156-351.000.
Rood, William E., Jr. Tine assembly and method for removal of debris from down cotton clumps. 4,390,376, Cl. 134-6.000.
Roquette Freres: *See*—
Huchette, Michel; and Leroy, Patrick, 4,390,523, Cl. 424-48.000.
Rose, George R., Jr., to Grumman Aerospace Corporation. Trifluorobromomethane foam fire fighting system. 4,390,069, Cl. 169-15.000.
Rosemount Inc.: *See*—
Rud, Stanley E., Jr., 4,389,895, Cl. 73-724.000.
Rosen, Evan W., to Engineering & Research Associates, Inc. Blood collection bag weighing device. 4,390,073, Cl. 177-118.000.
Rosenbaum, Herman S.; and Davies, John H., to General Electric Company. Thermal-mechanical treatment of composite nuclear fuel element cladding. 4,390,497, Cl. 376-414.000.
Rosenberg, Heinz: *See*—
Benecke, Wilhelm; and Rosenberg, Heinz, 4,390,941, Cl. 363-174.000.
Rosenberg, Robert: *See*—
Fowler, Alan B.; Rosenberg, Robert; and Rupprecht, Hans S., 4,389,768, Cl. 29-571.000.
Rosenberger, Siegfried, to Ciba-Geigy Corporation. Process for the preparation of p-allylphenols. 4,390,735, Cl. 568-790.000.
Ross, William J.: *See*—
Goldsworthy, John; Ross, William J.; and Verge, John P., 4,390,541, Cl. 424-258.000.
Rothwell, Harold L., Jr.; Gungle, W. Calvin; and Daignault, Alan, to GTE Products Corporation. High intensity discharge lamp including arc extinguishing means. 4,390,811, Cl. 315-73.000.
Rotoflow Corporation: *See*—
Swearingen, Judson S., 4,390,082, Cl. 184-6.400.
Rouland, Joseph G.: *See*—
Van Kampen, Hendrik; Rouland, Joseph G.; and Baakman, Hendrik J., 4,390,900, Cl. 358-147.000.
Rouse, John A., to Lucas Industries Limited, GBX2. High pressure hydraulic systems. 4,390,188, Cl. 280-6.100.
Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,390,724, Cl. 562-504.000.
Tully, Wilfred R., 4,390,697, Cl. 544-251.000.
Rowell, John A.: *See*—
Hyde, Paul E.; and Rowell, John A., 4,390,284, Cl. 366-165.000.
Rozzi, Mario, to Detroit Radiant Products Company. Tube-fired radiant heating system. 4,390,125, Cl. 237-70.000.
Rubenstein, Irving H.; and Bank, Herbert M., to Maryland Cup Corporation. Edible food containers and the method of coating said containers. 4,390,553, Cl. 426-138.000.
RUD-Kettenfabrik Rieger 6 Dietz GmbH u. Co.: *See*—
Rieger, Hansjorg; and Holzwarth, Dietmar, 4,390,053, Cl. 152-213.00A.
Rud, Stanley E., Jr., to Rosemount Inc. Capacitance pressure sensor. 4,389,895, Cl. 73-724.000.
Rudell, David C. Golf putter head and putter incorporating such head. 4,390,184, Cl. 273-183.00D.
Rudell, Elliot; Cernansky, Joseph; and Garner, Harold, to Rudell, Elliot. Pivotal jumping stick. 4,390,178, Cl. 272-114.000.
Rugg, Barry; and Stanton, Robert, to New York University. Process and continuous apparatus for chemical conversion of materials. 4,390,375, Cl. 127-37.000.
Ruhrkohle A G: *See*—
Fuchs, Heinz, 4,389,792, Cl. 33-304.000.
Runge, Hermann, to Boerung-Gebrauchsartikel GmbH. Container. 4,390,928, Cl. 362-101.000.
Ruo, Tomoki C. S.: *See*—
Stokowski, Robert J.; Tertzakian, Gerard; and Ruo, Tomoki C. S., 4,390,708, Cl. 549-229.000.
Rupprecht, Hans S.: *See*—
Fowler, Alan B.; Rosenberg, Robert; and Rupprecht, Hans S., 4,389,768, Cl. 29-571.000.
Rush, David H.: *See*—
Hahn, James H., 4,390,805, Cl. 310-154.000.
Rusinov, Mikhail M.; Judova, Galina N.; Kudryashov, Jury V.; and Agurok, Peisakh Y. Galilean-type telescope system. 4,390,249, Cl. 350-453.000.
Russell, Gilbert E.; and Wong, Hee, to National Semiconductor Corporation. Digital color modulator. 4,390,893, Cl. 358-27.000.
Russell, Jeffrey D.: *See*—
Best, David W.; and Russell, Jeffrey D., 4,390,988, Cl. 370-113.000.
Rustioni, Massimo: *See*—
Balducci, Luigi; and Rustioni, Massimo, 4,390,374, Cl. 106-300.000.
Ruthstrom, Olof J. J. Violin support. 4,389,916, Cl. 84-278.000.
Rutledge, Robert L., to Minnesota Mining and Manufacturing Company. Colloid relief images formed by oxidized developer transfer. 4,390,612, Cl. 430-202.000.
Rutledge, Thomas F., to ICI Americas Inc. Polymeric phenolic benzylic ether compositions. 4,390,731, Cl. 568-643.000.
Rutschilling, Paul C., to Paul Revere Corporation, The. Pressure sensing latch for a round baler. 4,389,930, Cl. 100-88.000.

S. C. Johnson & Son, Inc.: *See*—
Hernandez, Pablo M., 4,390,436, Cl. 252-49.300.
S. I. Handling Systems, Inc.: *See*—
Watatani, Minoru, 4,389,943, Cl. 104-166.000.
Saab-Scania Aktiebolag: *See*—
Nilsson, Sten E., 4,390,124, Cl. 237-12.30A.
Sado, Ryoichi; Morikawa, Yoshitusgu; Okamoto, Takekuni; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Rubber-made covering member for push button switches. 4,390,765, Cl. 200-159.00B.
Saf-T-Trac Company: *See*—
Fenley, Joel S., 4,390,055, Cl. 160-348.000.
Saigo, Hiroshi: *See*—
Iwaya, Hirokatsu; Saigo, Hiroshi; and Suzuki, Takashi, 4,389,811, Cl. 46-232.000.
Saint Gobain Vitrage: *See*—
Dages, Daniel, 4,390,594, Cl. 428-437.000.
St. Laurent, Wilfred H., Jr.: *See*—
Athanassiu, Christos; and St. Laurent, Wilfred H., Jr., 4,390,036, Cl. 137-116.500.
Saito, Kazuyoshi: *See*—
Takemura, Yasuhiko; and Saito, Kazuyoshi, 4,390,025, Cl. 128-660.000.
Saito, Kikuo: *See*—
Sato, Itsuzo; Ooi, Kazushige; Saito, Kikuo; Takemura, Yasuo; and Shinohara, Toshihiro, 4,390,895, Cl. 358-44.000.
Saito, Sadayuki: *See*—
Ito, Susumu; Saito, Sadayuki; and Higuchi, Kazuya, 4,390,167, Cl. 266-48.000.
Saito, Takashi; and Kishi, Toru, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a rotary recording medium clamping device. 4,390,979, Cl. 369-270.000.
Saito, Yoshitane: *See*—
Kawashima, Keisuke; Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, 4,390,966, Cl. 364-900.000.
Sakamoto, Hitoshi, to Sony Corporation. Video signal reproducing apparatus with tape tension control arrangement. 4,390,909, Cl. 360-71.000.
Sakamoto, Toshinori, to Toyo Kogyo Co. Ltd. Power operated automobile window glass regulating mechanism. 4,389,818, Cl. 49-349.000.
Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,390,534, Cl. 424-246.000.
Sakata, Hideo; and Takahashi, Seigo, to Kabushiki Kaisha Mitutoya Seisakusho. Measuring device. 4,389,783, Cl. 33-143.00K.
Sakata, Hideo; and Takahashi, Seigo, to Mitutoyo Mfg. Co., Ltd. Contour measuring instrument. 4,389,786, Cl. 33-174.00P.
Sakuma, Moriyuki: *See*—
Ueda, Toshimichi; Tezuka, Akira; Wakairo, Seiichi; Sakuma, Moriyuki; and Mochizuki, Masashi, 4,389,855, Cl. 62-200.000.
Salisbury, Winfield W., to Energy Profiles, Inc. Directed beam fusion reaction with ion spin alignment. 4,390,494, Cl. 376-107.000.
Salisbury, Winfield W., to Energy Profiles, Inc. Control of colliding ion beams. 4,390,495, Cl. 376-120.000.
Salvato, Guido A. Magnetically locked valve. 4,390,038, Cl. 137-296.000.
Sampei, Tohru; Asada, Akihiro; Ohta, Yoshihiro; and Iwasaki, Syunji, to Hitachi, Ltd. Speech analyzer. 4,390,747, Cl. 179-1.0SC.
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., to W. R. Grace & Co. Spheroidal alumina particles and catalysts employing the particles as a support. 4,390,456, Cl. 252-448.000.
Sanders, David E. B., Jr. Battery cable connector. 4,390,233, Cl. 339-255.00R.
Sanders, James M.: *See*—
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Sanders, Werner: *See*—
Fell, Wolfgang; and Sanders, Werner, 4,390,913, Cl. 360-85.000.
Sandoz Ltd.: *See*—
Wicki, Heinz; and Vogel, Claude, 4,390,470, Cl. 260-166.000..
Sands, Raymond L.; and Ward, Geoffrey M., to Chubb & Son's Lock and Safe Company Limited. Security enclosures. 4,389,948, Cl. 109-82.000.
Sanfeliu-Marimon, Jaime, to Storage Systems and Industrial Products Ltd. Framework for fixedly supporting a horizontal arm. 4,390,302, Cl. 403-187.000.
Sanford, William D.: *See*—
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Sano, Fumiaki: *See*—
Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.
Santi, Romano: *See*—
Gozzo, Franco; Troiani, Nicola; Lorusso, Simone; and Santi, Romano, 4,390,705, Cl. 549-3.000.
Sanyo Electric Co., Ltd.: *See*—
Horinouchi, Atsushi, 4,390,766, Cl. 219-10.55B.
Sarcia, Domenico S., to CVI Incorporated. Hybrid cryogenic refrigerator. 4,389,850, Cl. 62-6.000.
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Sasahara, Hitoshi: *See*—
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Sasaki, Takuma; and Nakamichi, Kazuya, to Maruzen Oil Co., Ltd. Preparation of antitumor agent from shellfish. 4,390,468, Cl. 260-112.00R.
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Sato, Itsuzo; Ooi, Kazushige; Saito, Kikuo; Takemura, Yasuo; and Shinohara, Toshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Color image pick-up apparatus. 4,390,895, Cl. 358-44.000.
Sato, Kimihiko: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.
Sato, Kozo; Iwakura, Ken; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Image recording members. 4,390,616, Cl. 430-338.000.
Satomura, Hiroshi, to Canon Kabushiki Kaisha. Toner regenerating device. 4,389,968, Cl. 118-652.000.
Saunders, Alton M. License plate hold-open device. 4,390,201, Cl. 296-1.00C.
Saunders, Hollis S.; Carmer, Richard V.; and Payette, Lionel J., to Essex Group, Inc. Power insertable polyamide-imide coated magnet wire. 4,390,590, Cl. 428-383.000.
Saurenman, Donald G., to Consan Pacific Incorporated. Control of static neutralization. 4,390,923, Cl. 361-222.000.
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Savko, Michael J. Automatic signal flag attachment for a mailbox. 4,390,122, Cl. 232-35.000.
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Sawyer, Philip N. Bandage with hemostatic agent and methods for preparing and employing the same. 4,390,519, Cl. 424-28.000.
Sawyer, Roy T.; Stent, Gunther S.; Budzynski, Andrei Z.; and Olexa, Stephanie A., to University of California, The Regents of the. Hementin--a fibrinolytic agent. 4,390,630, Cl. 435-226.000.
Saxlund, Oddmund. Method and apparatus for the operation of a boiler installation with stoker firing. 4,389,979, Cl. 122-15.000.
SB/JP Enterprises, Inc.: *See*—
Podell, Jack; and Haner, Douglas, 4,389,808, Cl. 46-16.000.
Schachar, Ronald A. Method for inhibiting contraction of opthalmic wounds or incisions. 4,390,542, Cl. 424-260.000.
Schaefer, Hans: *See*—
Stuttgen, Gunter; and Schaefer, Hans, 4,390,532, Cl. 424-240.000.
Schaefer, Louis B., IV; and Miller, Thomas M. Closure plug for ladle car. 4,390,170, Cl. 266-272.000.
Schaefer Marine, Inc.: *See*—
Merry, Carl A., 4,390,163, Cl. 254-412.000.
Schalke, Peter M.: *See*—
Kleemann, Axel; and Schalke, Peter M., 4,390,706, Cl. 349-74.000.
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Gyger, Paul; and Schar, Hugo, 4,389,751, Cl. 19-0.350.
Scharf, Gerhard: *See*—
Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, 4,390,773, Cl. 219-121.0PR.
Schechter, Michael M., to Ford Motor Company. Multipole solenoids. 4,390,856, Cl. 335-256.000.
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Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Beier, Sybille, 4,390,530, Cl. 424-238.000.
Schering Corporation: *See*—
Loshaek, Samuel, 4,390,676, Cl. 526-313.000.
Scheuren, Jurgen: *See*—
Henne, Werner; and Scheuren, Jurgen, 4,390,455, Cl. 252-430.000.
Schilf, Lothar; and Giese, Ingo H., to Erno-Raumfahrttechnik GmbH. Measuring minute, local temperature differences. 4,390,275, Cl. 356-43.000.
Schlaufman, Robert J.: *See*—
Olson, John H.; and Schlaufman, Robert J., 4,390,593, Cl. 428-410.000.
Schleicher, Herbert: *See*—
Krampe, Dietrich; and Schleicher, Herbert, 4,390,821, Cl. 318-85.000.
Schleusner, Clifford E., to Haagenson, Bruce. Vehicle/trailer lighting connector apparatus. 4,390,228, Cl. 339-113.00R.
Schlumberger Technology Corporation: *See*—
Grau, James A., 4,390,783, Cl. 250-270.000.
Schmid, Gunther: *See*—
Koder, Manfred; and Schmid, Gunther, 4,389,883, Cl. 73-119.00R.
Schmid, Hans D.: *See*—
Orova, Josef; Roderer, Herbert; Schmid, Hans D.; and Steffen, Horst-G., 4,390,804, Cl. 310-70.00R.
Schmidhammer, Helmut: *See*—
Brossi, Arnold; Schmidhammer, Helmut; and Jacobson, Arthur E., 4,390,699, Cl. 546-74.000.

Schmidt, Donald L.: *See*—
Clarke, Donald H.; Pomranky, George J.; and Schmidt, Donald L., 4,390,644, Cl. 521-121.000.
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Browning, David R.; Sima, Gordon R., Jr.; Schmidt, John C.; and Sickenberger, David W., 4,390,784, Cl. 250-287.000.
Schmidt, Robert W., to Copar Corporation. Means for controlling the application of glue to a defined area. 4,389,971, Cl. 118-669.000.
Schmitt, Frederick L.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,390,464, Cl. 252-522.00R.
Schmoock, James C., to Raytheon Company. Temperature compensated switchable current source. 4,390,799, Cl. 307-310.000.
Schneider, Manfred, to Textima VEB Wirkmaschinenbau Karl-Marx-Stadt Kombinat Textima. Warp knitting machine for the production of jacquard-patterned pile-knit fabrics. 4,389,860, Cl. 66-84.00R.
Schneider, Richard J. Aircraft ski mounting assembly. 4,390,151, Cl. 244-108.000.
Schneider, Walter: *See*—
Hodes, Erich; Sternisa, Danilo; and Schneider, Walter, 4,390,563, Cl. 427-27.000.
Schnippering, Manfred: *See*—
Luck, Karl-Heinz; Kallenberg, Albert; Schnippering, Manfred; and Moeselaken, Herbert, 4,389,757, Cl. 24-205.10R.
Schoeneberger, Ernest A., to Sperry Corporation. Automatic latch for unloading auger. 4,390,094, Cl. 198-865.000.
Schott Glaswerke: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,390,638, Cl. 501-77.000.
Schreurs, Petrus H. M.: *See*—
Havinga, Reginoldus; Torenbeek, Reinder; and Schreurs, Petrus H. M., 4,390,451, Cl. 252-311.000.
Schulein, Rolf-Gunter; and Hagedorn, Leonard, to ITT Industries, Inc. Keep-fresh storage container with lid. 4,390,109, Cl. 220-234.000.
Schuler, Ralf; and Maahs, Gunther, to Chemische Werke Huels, A.G. Vinyl chloride polymer flameproofed and smoke inhibited with a copper phosphate. 4,390,654, Cl. 524-413.000.
Schulz, Johann G.; and Margosian, Daniel, to Gulf Research & Development Company. Novel composition and process for producing solid resin therefrom. 4,390,661, Cl. 524-878.000.
Schulzer, Odilo, to Transformatoren Union Aktiengesellschaft. Liquid-cooled transformer for large power ratings. 4,390,858, Cl. 336-92.000.
Schumacher, Heinz O. Apparatus for trouble-free and continuous charging of extractors with extraction feedstock to be treated and with extractant or solvent. 4,390,506, Cl. 422-273.000.
Schwartz, Ellen S.; and Tincher, Cline A., to BASF Wyandotte Corporation. Water-based hydraulic fluids having improved lubricity and corrosion inhibiting properties employing neodecanoic acid. 4,390,439, Cl. 252-73.000.
Schwartz, Ellen S.; and Tichner, Cline A., to BASF Wyandotte Corporation. Thickened water-based hydraulic fluids. 4,390,440, Cl. 252-76.000.
Schwarz, Albert J.; and Kowal, Leonard J., to Imperial Clevite Inc. Tube bender construction. 4,389,873, Cl. 72-388.000.
Schwarze, Werner; Kleemann, Axel; and Leuchtenberger, Wolfgang, to Degussa Aktiengesellschaft. 1-Methyl-2-chlorocyclopropanecarboxylic acid and its ester. 4,390,719, Cl. 560-124.000.
Schwenk, Wilhelm; Heinrich, Bruno; and Mangen, Rolf, to Mannesmannufer Aktiengesellschaft. Lining a steel pipe internally with a cement mortar. 4,390,568, Cl. 427-234.000.
Schwitters, Stephen W., to Taylor Freezer Company. Conductivity type in-line liquid sensing apparatus. 4,390,760, Cl. 200-61.040.
Scieur, Roger. Tilt-sensitive ignition switch. 4,390,759, Cl. 200-52.00A.
Scinta, James; and Hart, Peter J., to Phillips Petroleum Company. Recovery of hydrocarbon values from low organic carbon content carbonaceous materials via hydrogenation and supercritical extraction. 4,390,411, Cl. 208-11.0LE.
Scott, Fraser: *See*—
Budden, Raymond G.; and Scott, Fraser, 4,390,276, Cl. 356-251.000.
Scott Paper Company: *See*—
Christensen, Rolf E., 4,389,965, Cl. 118-261.000.
Scovill Inc.: *See*—
Butts, Lawrence D., 4,390,197, Cl. 292-144.000.
Scriminger, William F., to Muskogee Environmental Conservation Co. Slurry gun. 4,390,281, Cl. 366-3.000.
Sczerba, Stanley T., to Koppers Company, Inc. Heat dissipating charging hole cover. 4,390,397, Cl. 202-243.000.
Sealed Air Corporation: *See*—
Gately, Dana R., 4,390,337, Cl. 425-89.000.
Sears, Jerald R.: *See*—
Merilan, Charles P.; and Sears, Jerald R., 4,390,633, Cl. 436-65.000.
Seeney, Charles E., to International Minerals & Chemical Corp. Metal silico-phosphate binders and foundry shapes produced therefrom. 4,390,370, Cl. 106-38.300.
Segal, Leon, to Allied Corporation. Method of shaping thermoplastic compositions on aluminum foil support. 4,390,489, Cl. 264-126.000.
Seibert, Lloyd; and Ellefsen, George E., to American Sign & Indicator Corporation. Matrix display. 4,389,804, Cl. 40-447.000.
Seidler, Robert L. Regulator and switching circuit for flasher units. 4,390,812, Cl. 315-200.00A.
Seismograph Service Corporation: *See*—
Moses, Donald W., 4,390,986, Cl. 370-99.000.
Seitz-Werke GmbH: *See*—
Zelder, Felix, 4,390,048, Cl. 141-6.000.
Seiwa Kagaku Kabushiki Kaisha: *See*—
Niibori, Kenji; and Ishihama, Toshio, 4,390,054, Cl. 160-265.000.
Seiwa Kasei Co., Ltd.: *See*—
Yoshioka, Isaei; and Kamimura, Yoichi, 4,390,525, Cl. 424-71.000.
Selegny, Eric: *See*—
Junier, Guy-Alain; Lemeland, Jean-Francois; Selegny, Eric; and Vingent, Jean-Claude, 4,390,620, Cl. 435-4.000.
Selinko, George J., to Motorola, Inc. Molded multifunction latch mechanism. 4,390,198, Cl. 292-152.000.
Sellman, Millhim D.: *See*—
Alani, Safwat D.; and Sellman, Millhim D., 4,390,027, Cl. 128-743.000.
Seltzer, Raymond: *See*—
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Senscom Corporation: *See*—
Fernekes, Robert W.; and Tesser, Murray V., 4,390,257, Cl. 353-95.000.
Serpaud, Jean: *See*—
Lejeune, Pierre; and Serpaud, Jean, 4,390,429, Cl. 210-519.000.
Seto, Tadayuki: *See*—
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Severing, Joachim: *See*—
Meyer, Friedhelm; Kurz, Wolfgang; and Severing, Joachim, 4,390,792, Cl. 307-10.0BP.
Shacter, Stuart B.: *See*—
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Shah, Bakulesh: *See*—
Ritzer, Alan; Shah, Bakulesh; and Sliva, Daniel E., 4,390,510, Cl. 423-342.000.
Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., to Texas Instruments Incorporated. Apparatus and method for fluid transfer. 4,390,885, Cl. 346-140.00R.
Shah, Rajiv R.: *See*—
Robinson, John T.; Cecil, Olin B.; and Shah, Rajiv R., 4,390,392, Cl. 156-643.000.
Sharma, Ashok K.: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,390,405, Cl. 204-415.000.
Sharon K. Baumann Trust: *See*—
Baumann, Hanns U., 4,389,831, Cl. 52-741.000.
Sharp Kabushiki Kaisha: *See*—
Ohshita, Akihiro, 4,390,834, Cl. 179-1.0VL.
Ohta, Kenji; and Takahashi, Akira, 4,390,600, Cl. 428-621 000.
Shimizu, Keiichiro; and Horii, Wataru, 4,390,245, Cl. 350-343.000.
Sharrock, Michael; Fry, Donovan N.; and William, Robert, to Joel & Aronoff, Inc. Pockets for garments. 4,389,801, Cl. 40-159.000.
Shattuck, Meredith D.: *See*—
Gaitos, Janise N.; Shattuck, Meredith D.; and Wilbur, Clayton V., 4,390,297, Cl. 400-697.100.
Shawhan, Elbert N., to NL Sperry-Sun, Inc. Data transmission in a drill string. 4,390,975, Cl. 367-82.000.
Shell Oil Company: *See*—
Blytas, George C., 4,390,516, Cl. 423-573.00R.
Ward, John M., 4,390,043, Cl. 138-89.000.
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Johnston, Howard R.; and Koombes, Michael E. R. V., 4,390,904, Cl. 358-335.000.
Sheperd, Charles E., to C. E. Shepherd Company, Inc. Spraying apparatus for water cooling tower. 4,390,478, Cl. 261-6.000.
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Sherman, Philip B., to Texaco Inc. Recovery of solvent in hydrocarbon processing systems. 4,390,418, Cl. 208-326.000.
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Shichman, Daniel: *See*—
Singh, Anand P.; and Shichman, Daniel, 4,390,334, Cl. 425-28.00R.
Shigematsu, Takashi; and Watanabe, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control method and system therefor. 4,389,992, Cl. 123-419.000.
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Shimoda, Haruo; and Tanabe, Kaoru, to Fujitsu Limited. Boat for carrying semiconductor substrates. 4,389,967, Cl. 118-500.000.
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Sado, Ryoichi; Morikawa, Yoshitusgu; Okamoto, Takekuni; and Tahara, Kazutoki, 4,390,765, Cl. 200-159.00B.
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Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, 4,390,166, Cl. 266-44.000.

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Misaki, Susumu; Suefuji, Masahiro; Tsushima, Tadahiko; and Tanida, Hiroshi, 4,390,702, Cl. 546-296.000.

Shirai, Hiroshi: *See*—
Mori, Teruo; Shirai, Hiroshi; Kakei, Tsutomu; Watanabe, Masaru; and Matsuhisa, Tsuneyasu, 4,390,407, Cl. 204-206.000.

Shishido, Satohiro: *See*—
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Shmigidin, Viktor G.: *See*—
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Short, Charles. Apparatus for production of liquid from wells. 4,390,061, Cl. 166-53.000.

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Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.

Showman, Robert L.; and Weber, Robert N., to AMP Incorporated. Two piece zero insertion force connector. 4,390,224, Cl. 339-75.0MP.

Shulga, Vasily T.: *See*—
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SI Handling Systems Inc.: *See*—
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Sickenberger, David W.: *See*—
Browning, David R.; Sima, Gordon R., Jr.; Schmidt, John C.; and Sickenberger, David W., 4,390,784, Cl. 250-287.000.

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Siemens Aktiengesellschaft: *See*—
Bahlinger, Walter, 4,390,891, Cl. 357-79.000.
Benecke, Wilhelm; and Rosenberg, Heinz, 4,390,941, Cl. 363-174.000.
Dull, Hans-Jurgen; and Hillmer, Adolf, 4,389,942, Cl. 104-103.000.
Ganssen, Alexander; Oppelt, Arnulf; and Loeffler, Wilfried, 4,390,840, Cl. 324-309.000.
Hartig, F. Gunter, 4,389,989, Cl. 123-339.000.
Hoffmann, Christian; Zollner, Manfred; and Zwicker, Eberhard, 4,390,756, Cl. 179-107.0BC.
Krampe, Dietrich; and Schleicher, Herbert, 4,390,821, Cl. 318-85.000.
Mathuni, Josef; and Unger, Karin, 4,390,394, Cl. 156-643.000.
Risch, Lothar; and Mader, Hermann, 4,390,888, Cl. 357-30.000.
Watzke, Franz, 4,390,762, Cl. 200-144.00B.
Wiessner, Edgar, 4,390,757, Cl. 200-11.00G.
Zwicker, Eberhard, 4,390,748, Cl. 179-1.00N.

Siemon Company, The: *See*—
Knickerbocker, Robert H., 4,390,230, Cl. 339-125.00R.

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Sierwald, Karl: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.

Signetics: *See*—
Blauschild, Robert A., 4,390,848, Cl. 330-151.000.

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Sihi GmbH & Co. KG: *See*—
Lehmann, Wilfried; and Fandrey, Peter, 4,390,317, Cl. 415-143.000.

Sima, Gordon R., Jr.: *See*—
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Simjian, Luther G. Exercise apparatus. 4,390,180, Cl. 272-126.000.

Simmons, Carlton J., Jr.: *See*—
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Simmons U.S.A. Corporation: *See*—
Callaway, Milton A., 4,389,743, Cl. 5-464.000.

Singer Company, The: *See*—
Brown, Jack; and Wurst, John W., 4,390,823, Cl. 318-331.000.
Brown, Jack, 4,390,824, Cl. 318-331.000.
Cohen, Edwin; and Maynard, Jack A., 4,390,861, Cl. 340-27.00R.
Cornforth, Malcolm W.; and Jacobsen, Robert S., 4,390,956, Cl. 364-510.000.
Larsen, Robert H.; and Giaimo, Anthony, 4,389,955, Cl. 112-184.000.

Singh, Anand P.; and Shichman, Daniel, to NRM Corporation. Hydraulic tire press. 4,390,334, Cl. 425-28.00R.

Sirafuji, Tamio: *See*—
Inoue, Yasuhiko; Wake, Shigeo; Sirafuji, Tamio; and Beppu, Masazo, 4,390,736, Cl. 568-801.000.

Skarlos, Leonidas; and Dille, Roger M., to Texaco Inc. Coal slurry monitor means and method. 4,390,957, Cl. 364-550.000.

Skeem, Wayne B. Round bale transporter and feeder. 4,390,312, Cl. 414-24.600.

Skillman, Dale N. Solar energy collecting apparatus and roll-formed metal building. 4,390,010, Cl. 126-450.000.

Skripek, Milan: *See*—
Dvoracek, Louis M.; Fischer, Paul W.; and Skripek, Milan, 4,390,412, Cl. 208-48.00R.

Slater, Charles A., Jr.; and Darby, Spencer A., to Peterson Manufacturing Co. Resilient suspension mount. 4,390,936, Cl. 362-390.000.

Sliva, Daniel E.: *See*—
Ritzer, Alan; Shah, Bakulesh; and Sliva, Daniel E., 4,390,510, Cl. 423-342.000.

Sloan, Albert H. Portable hot water system for diver's suit. 4,390,305, Cl. 405-186.000.

Sloboda, Adolph E., to American Cyanamid Company. Combinations of agents which give enhanced anti-inflammatory activity. 4,390,545, Cl. 424-275.000.

Smetana, Roland; and Werner, Franz, to U.S. Philips Corporation. Tape guide system. 4,390,119, Cl. 226-196.000.

Smith, Archie L.: *See*—
McGee, John K.; Lafferty, Harold L.; Bridges, Charles D.; and Smith, Archie L., 4,390,186, Cl. 277-236.000.

Smith, David E.: *See*—
Mendiola, Joseph V.; and Smith, David E., 4,390,052, Cl. 152-356.00R.

Smith, Donald O.; and Harte, Kenneth J., to Control Data Corporation. Electron beam array lithography system employing multiple parallel array optics channels and method of operation. 4,390,789, Cl. 250-492.200.

Smith, Gertrude I.: *See*—
Bunas, Norman L.; and Smith, Gertrude I., 4,390,389, Cl. 156-502.000.

Smith, Gregory M.: *See*—
Bullard, Edward M.; and Smith, Gregory M., 4,390,573, Cl. 428-35.000.

Smith, James L., to United States of America, Army. Process for producing orthographic projection image of complex terrain/targets from an automatic system using two photographs. 4,390,271, Cl. 355-77.000.

Smith, Stuart B., to Thermocell Development, Ltd. Flame-retardant benzylic-ether phenolic modified foam and method of preparing same. 4,390,641, Cl. 521-103.000.

Smith, Stuart B., to Thermocell Development, Ltd. Flame-retardant, thermosetting foam product and method of preparing same. 4,390,642, Cl. 521-112.000.

Smithgall, David H., Sr., to Western Electric Company, Inc. Technique for automatically centering a lightguide fiber in a coating. 4,390,897, Cl. 358-101.000.

Smorol, Michael E.: *See*—
Haas, Rudy E.; Smorol, Michael E.; Tobin, Curtis L.; and Walker, James J., Jr., 4,390,059, Cl. 165-76.000.

Snead, Edwin deS. Load weighing and accumulating system and method. 4,390,075, Cl. 177-210.0FP.

Societe Anonyme dite: Alstrom-Atlantique: *See*—
Lejeune, Pierre; and Serpaud, Jean, 4,390,429, Cl. 210-515.000.

Societe Anonyme dite: L'Oreal: *See*—
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,390,522, Cl. 424-45.000.
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,390,689, Cl. 528-335.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Chiovini, Jacky; Blanc, Maurice; and Margolis, Geoffrey, 4,390,698, Cl. 544-274.000.

Societe Industrielle de Brevets et D'Etudes (SIBE): *See*—
Noisier, Guy, 4,390,480, Cl. 261-34.00A.

Societe Lab: *See*—
Vicard, Pierre G., 4,390,426, Cl. 210-243.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Fournier, Jacques M. A., 4,389,891, Cl. 73-579.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Robinet, Alain, 4,389,880, Cl. 73-86.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Briens, Guy, 4,390,584, Cl. 428-116.000.
Corbefin, Rene; and Vacelet, Gabriel, 4,390,940, Cl. 363-132.000.

Sohma, Yoshio, to Nikko Kogyo Kabushiki Kaisha. Binding device. 4,389,754, Cl. 24-16.0PB.

Sojka, Richard J.; Braverman, Leonard W.; Guch, Steve, Jr.; and Clark, David J., to GTE Products Corporation. Laser electrode assembly. 4,390,993, Cl. 372-87.000.

Solaroli, Sergio, to Finike Italiana Marposs S.p.A. Gauge for the geometrical and/or dimensional checking of pieces rotating about a geometrical axis. 4,389,787, Cl. 33-174.00Q.

Solender, Peter E.: *See*—
Eglowstein, Ira; and Solender, Peter E., 4,390,967, Cl. 364-900.000.

Solex Research Corporation of Japan: *See*—
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,390,508, Cl. 423-112.000.

Somogyi, Gyorgy: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.
Somorjai, Gabor A. Fuel compositions and additive mixtures for reducing hydrocarbon emissions. 4,390,345, Cl. 44-63.000.
Sony Corporation: *See*—
Arai, Kiyoshi, 4,389,935, Cl. 101-93.010.
Matsuyama, Atsuo, 4,390,915, Cl. 360-104.000.
Nagai, Tamiji; and Ishigaki, Yoshio, 4,390,818, Cl. 315-408.000.
Nakamura, Tadahiko; Nakano, Kenji; and Tajima, Shigeru, 4,390,908, Cl. 360-70.000.
Sakamoto, Hitoshi, 4,390,909, Cl. 360-71.000.
Sotoyama, Toshiki: *See*—
Yatsu, Tadao; Todo, Akira; and Sotoyama, Toshiki, 4,390,683, Cl. 528-194.000.
Southern California Edison Co., Inc.: *See*—
Bjorklund, Glenn J.; and Phillips, Charles E., 4,390,876, Cl. 340-825.170.
Southern Systems, Inc.: *See*—
Linton, Leon; and Kiss, David B., 4,389,944, Cl. 104-172.00S.
Spectro-Systems, Incorporated: *See*—
Gaven, Joseph V., Jr.; and Bak, Chan S., 4,390,291, Cl. 374-160.000.
Spekman, Paul, Jr., to Fremont Industries, Inc. Low temperature composition for plating pretreatment of ferrous metals. 4,390,465, Cl. 252-527.000.
Sperry Corporation: *See*—
Schoeneberger, Ernest A., 4,390,094, Cl. 198-865.000.
Spigarelli, Donald J.; and Dustin, Paul C., to HTC Corporation, The. Continuous vapor processing system. 4,389,797, Cl. 34-73.000.
Spohr, Albert R.: *See*—
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,389,772, Cl. 30-43.900.
Sprenger, Walter: *See*—
Walz, Gerd; Wirth, Thaddaus; and Sprenger, Walter, 4,390,688, Cl. 528-295.300.
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Two pulse tachycardia control pacer. 4,390,021, Cl. 128-419.0PG.
Stacey, Eric J., to Westinghouse Electric Corp. Cycloconverter apparatus with controllable end stop firing pulse control means. 4,390,938, Cl. 363-54.000.
Stacy, Carl J., to Phillips Petroleum Company. Reinforced rubbery composition. 4,390,648, Cl. 523-216.000.
Stahlecker, Fritz: *See*—
Stahlecker, Hans; and Braxmeier, Hans, 4,389,837, Cl. 57-16.000.
Stahlecker, Hans; and Braxmeier, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Ply yarn spinning assembly. 4,389,837, Cl. 57-16.000.
Stahn, Roland: *See*—
Frabricius, Hans-Ake; and Stahn, Roland, 4,390,623, Cl. 435-68.000.
Stamicarbon, B.V.: *See*—
Weterings, Cornelis A. M.; and Janssen, Johannes A., 4,390,507, Cl. 423-8.000.
Standard Oil Company: *See*—
Isley, Ralph E., 4,390,652, Cl. 524-322.000.
Pesa, Frederick A.; and Graham, Anne M., 4,390,639, Cl. 518-713.000.
Standard Oil Company (Indiana): *See*—
Klotz, Marvin R., 4,390,457, Cl. 252-455.00Z.
Lee, Richard J.; and Murphy, Lynn M. R., 4,390,437, Cl. 252-51.50A.
Stanley, Charles A., to Litek International Inc. Transformer for driving Class D amplifier. 4,390,813, Cl. 315-248.000.
Stanley, Frederick W., Jr.; and Fairchok, William J., to Dow Chemical Company, The. Method for the preparation of quaternary carboxamide polymers. 4,390,659, Cl. 524-555.000.
Stanton, James L., to Ciba-Geigy Corporation. 1-Carboxyazaalkanoyltetrahydroquinoline-2-carboxylic acids. 4,390,700, Cl. 546-165.000.
Stanton, Robert: *See*—
Rugg, Barry; and Stanton, Robert, 4,390,375, Cl. 127-37.000.
Stauffer Chemical Company: *See*—
Chin, Htiao-Ling M., 4,390,549, Cl. 424-324.000.
Steelcase, Incorporated: *See*—
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.
Steen, William M.; and Duley, Walter W., to National Research Development Corporation. Method and apparatus for treating electrically non-conductive workpieces. 4,390,774, Cl. 219-121.0FS.
Steffen, Horst-G.: *See*—
Orova, Josef; Roderer, Herbert; Schmid, Hans D.; and Steffen, Horst-G., 4,390,804, Cl. 310-70.00R.
Steigerwald, Robert L., to General Electric Company. Induction heating apparatus providing smooth power control. 4,390,769, Cl. 219-10.770.
Stent, Gunther S.: *See*—
Sawyer, Roy T.; Stent, Gunther S.; Budzynski, Andrei Z.; and Olexa, Stephanie A., 4,390,630, Cl. 435-226.000.
Stepan Chemical Company: *See*—
Nussbaum, Marvin L.; and Knaggs, Edward A., 4,390,474, Cl. 260-505.00R.
Stephans, Emery J.: *See*—
Curtis, Huntington W.; Kellogg, Robert M.; Kissinger, Kerry W.; Mappes, Robert P.; and Stephans, Emery J., 4,390,499, Cl. 422-72.000.
Stephens, James R.: *See*—
Trautlein, Fred S.; and Stephens, James R., 4,390,099, Cl. 211-4.000.
Stern, Max H.: *See*—
Gabrielsen, Rolf S.; Graham, Patricia A.; Klijanowicz, James E.; and Stern, Max H., 4,390,606, Cl. 430-9.000.
Sternisa, Danilo: *See*—
Hodes, Erich; Sternisa, Danilo; and Schneider, Walter, 4,390,563, Cl. 427-27.000.
Stevens, Edward J., to Minnesota Mining & Manufacturing Company. Microparticles with visual identifying means. 4,390,452, Cl. 252-408.100.
Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm: *See*—
Henoch, Bengt, 4,390,880, Cl. 343-6.8LC.
Stoker, James: *See*—
Weldon, Howard; and Stoker, James, 4,390,155, Cl. 248-507.000.
Stokowski, Robert J.; Tertzakian, Gerard; and Ruo, Tomoki C. S., to Terochem Laboratories Ltd. Process for producing oxalyl chloride and intermediates. 4,390,708, Cl. 549-229.000.
Stoll, Kurt. Optical display unit for pneumatic systems. 4,389,962, Cl. 116-272.000.
Stone & Webster Engineering Corporation: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,390,502, Cl. 422-145.000.
Stoneburner, Leonard G., to Mead Corporation, The. Fluid jet priat head and method of terminating operation thereof. 4,390,883, Cl. 346-75.000.
Stora Kopparbergs Bergslags Aktiebolag: *See*—
Andreason, Gustav O.; Friberg, Ulf R.; Kuvaja, Heimo H.; and Qvarnstrom, Bengt G. L., 4,389,814, Cl. 47-73.000.
Storage Systems and Industrial Products Ltd.: *See*—
Sanfeliu-Marimon, Jaime, 4,390,302, Cl. 403-187.000.
Strahan, Robert M.; Hopf, Philip W.; and Williams, Phillip G., to General Motors Corporation. Energy absorbing steering wheel assembly. 4,390,193, Cl. 280-777.000.
Strickland, Lawrence P., to Motorola, Inc. Gated quadrature detector biased to switch on sinusoidal zero crossings. 4,390,845, Cl. 329-103.000.
Stringer, Frederick D.: *See*—
Ferguson, Daniel J.; Stringer, Frederick D.; and Esakov, Michael D., 4,390,385, Cl. 156-229.000.
Strout, Robert B., to Gillette Company, The. Apparatus for shearing and coiling strip material. 4,389,868, Cl. 72-132.000.
Struthers, Ralph C. Fuel cell. 4,390,602, Cl. 429-26.000.
Students, Peter A.: *See*—
Preiss, Martin D.; and Students, Peter A., 4,390,356, Cl. 62-35.000.
Studer, Philip A.: *See*—
United States of America, National Aeronautics and Space Administration; Gasser, Max G.; Sherman, Allan; Studer, Philip A.; Daniels, Alexander; and Goldowsky, Michael P., 4,389,849, Cl. 62-6.000.
Stumm, Hans-Peter: *See*—
Denz, Helmut; Stumm, Hans-Peter; and Zechnall, Martin, 4,389,994, Cl. 123-478.000.
Stuttgen, Gunter; and Schaefer, Hans, to Dr. Carl Hahn, G.m.b.H. Topical combinations of an α-estradiol with a methyl xanthine. 4,390,532, Cl. 424-240.000.
Suefuji, Masahiro: *See*—
Misaki, Susumu; Suefuji, Masahiro; Tsushima, Tadahiko; and Tanida, Hiroshi, 4,390,702, Cl. 546-296.000.
Suenaga, Yoshihiko: *See*—
Hayashi, Soichiro; and Suenaga, Yoshihiko, 4,390,788, Cl. 250-491.100.
Sueyoshi, Toshinobu; Hirai, Shigeo; and Amemiya, Masahiro, to Hitachi Maxell, Ltd. Process for preparing ferromagnetic particles comprising metallic iron. 4,390,361, Cl. 75-0.5BA.
Suffi, Louis; Golden, James E.; and Burtelson, Frederick W., to Northern Telecom, Inc. Fixed count terminal. 4,390,744, Cl. 174-41.000.
Suganuma, Tsuneo: *See*—
Miyauchi, Katsuki; Oi, Tetsu; and Suganuma, Tsuneo, 4,390,460, Cl. 252-518.000.
Sugawara, Isao, to Kabushiki Kaisha Chiyoda. Electric power source device. 4,390,939, Cl. 363-129.000.
Sugawara, Tsutomu: *See*—
Yamada, Hisashi; and Sugawara, Tsutomu, 4,390,847, Cl. 330-51.000.
Sugimoto, Toshiaki: *See*—
Ando, Tomonori; Hanyuda, Toshiaki; Shishido, Satohiro; Sano, Fumiaki; Ochi, Kiyoyuki; Sugimoto, Toshiaki; and Okino, Yoshiro, 4,390,662, Cl. 525-28.000.
Sugiura, Kazumasa; Mori, Kinji; Ihara, Hirokazu; and Kawai, Yoshinori, to Hitachi, Ltd. Status check method for a data transmission system. 4,390,984, Cl. 370-88.000.
Sullivan, Wayne M.: *See*—
Enen, Jack, Jr.; and Sullivan, Wayne M., 4,390,064, Cl. 166-99.000.
Sultan, S. Bertil, to Xerox Corporation. Ink jet printing machine. 4,390,886, Cl. 346-140.0PD.
Sumita, Toru, to Minolta Camera Kabushiki Kaisha. Mount member for optical apparatus. 4,390,263, Cl. 354-286.000.
Sumitomo Chemical Company, Limited: *See*—
Inoue, Yasuhiko; Wake, Shigeo; Sirafuji, Tamio; and Beppu, Masazo, 4,390,736, Cl. 568-801.000.
Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, 4,390,535, Cl. 424-246.000.

Sumitomo Metal Industries Co., Ltd.: *See*—
Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, 4,390,166, Cl. 266-44.000.

Sunbeam Corporation: *See*—
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,389,772, Cl. 30-43.900.

Sundstrand Corporation: *See*—
Mulier, Hans R., 4,390,950, Cl. 364-434.000.

Sundt, Eilert, to Olaf Fjeldsend A/S. Apparatus for magnetic treatment of a flowing liquid. 4,390,423, Cl. 210-222.000.

Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., to Oy Lohja AB. Apparatus for performing growth of compound thin films. 4,389,973, Cl. 118-725.000.

Superscope, Inc.: *See*—
Pearson, Erik W., 4,390,749, Cl. 179-1.0GJ.

Superwinch, Inc.: *See*—
Nelson, Robert G., 4,390,161, Cl. 254-356.000.

Sutter, Hanspeter, to Luwa AG. Apparatus for the compaction of fibers. 4,389,931, Cl. 100-90.000.

Suverison, Lyle B.: *See*—
Plyler, Robert G.; and Suverison, Lyle B., 4,390,231, Cl. 339-217.00S.

Suwa, Kyoichi, to Nippon Kogaku K. K. Alignment device in an IC projection exposure apparatus. 4,390,279, Cl. 356-401.000.

Suyama, Nobuo: *See*—
Kyo, Kayomon; Asai, Yasuhiko; Hirose, Isamu; and Suyama, Nobuo, 4,390,682, Cl. 528-194.000.

Suzuki, Hidetaka: *See*—
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.

Suzuki, Kazuhiro: *See*—
Kanada, Toshiaki; Suzuki, Kazuhiro; Yoshioka, Hiroshi; Maeda, Kenji; and Tsurumi, Yoshihiro, 4,390,643, Cl. 521-117.000.

Suzuki, Koji; Inuzuka, Tsuneki; and Kurita, Kenji, to Canon Kabushiki Kaisha. Image forming apparatus. 4,390,265, Cl. 355-14.00D.

Suzuki, Ryushi: *See*—
Matsui, Kunio; Tsuchiya, Hiroaki; and Suzuki, Ryushi, 4,390,351, Cl. 55-204.000.

Suzuki, Takashi: *See*—
Iwaya, Hirokatsu; Saigo, Hiroshi; and Suzuki, Takashi, 4,389,811, Cl. 46-232.000.

Svendsen, Biarne R., to Genvex Energiteknik A/S. Heat exchanger. 4,389,857, Cl. 62-325.000.

Sviatoslavsky, Nicolas N.; and Kelpin, Charles A., to Appleton Electric Company. Hinge construction for electrical enclosures. 4,390,114, Cl. 220-337.000.

Swamy, K. H. Sreedhara: *See*—
Goldberg, Alfred L.; Swamy, K. H. Sreedhara; and Chung, Chin H., 4,390,629, Cl. 435-220.000.

Swank, Harry R.: *See*—
Mitchell, Robert B.; and Swank, Harry R., 4,390,809, Cl. 313-482.000.

Swartley, John S.; and Der Avedisian, Suren, to General Foods Corporation. Heating utensil and associated circuit completing pouch. 4,390,551, Cl. 426-107.000.

Swearingen, Judson S., to Rotoflow Corporation. Reserve lubricant supply system. 4,390,082, Cl. 184-6.400.

Swedlow, Inc.: *See*—
White, William H.; Harbison, William C.; and Nelson, Gary L., 4,390,373, Cl. 106-287.120.

Sweeney, William M., to Texaco Inc. Gasohol maintained as a single mixture by the addition of an acetal, a ketal or an orthoester. 4,390,344, Cl. 44-56.000.

Sweeney, William M., to Texaco Inc. Method for dewatering non-aqueous liquids. 4,390,417, Cl. 208-188.000.

Swift, Stephen J.: *See*—
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,390,021, Cl. 128-419.0PG.

SWS Silicones Corporation: *See*—
Martin, Eugene R., 4,390,713, Cl. 556-418.000.

Syed, Ali N.: *See*—
Khalil, Ezzat N.; and Syed, Ali N., 4,390,033, Cl. 132-7.000.

Syntex Pharmaceuticals International Ltd.: *See*—
Edgren, Richard A., 4,390,531, Cl. 424-239.000.

Syscom, Inc.: *See*—
Wood, Leonard J.; Parasuraman, Balakrishna; Williams, Edwin H.; Alexander, Mark G.; and Montgomery, Richard C., Jr., 4,390,981, Cl. 370-56.000.

Szacsvay, Gabor: *See*—
Boeni, Hans; Meier, Beda; and Szacsvay, Gabor, 4,389,870, Cl. 72-354.000.

Szarka, Sandor: *See*—
Jaffa, David; and Szarka, Sandor, 4,389,936, Cl. 101-123.000.

Szedlacsek, Jozsef: *See*—
Adelhard, Georg; Hasselberg, Herbert; Obermeier, Manfred; Sierwald, Karl; Szedlacsek, Jozsef; and Somogyi, Gyorgy, 4,389,838, Cl. 57-71.000.

Szirniks, Klaus G.: *See*—
Gloystein, Jurgen F. G.; and Szirniks, Klaus G., 4,389,761, Cl. 24-287.000.

Szkalak, Kalman Z. Multi-station exercising apparatus. 4,390,179, Cl. 272-118.000.

Szonntagh, Eugene L., to Honeywell Inc. Temperature sensor and detector cell utilizing the same. 4,389,876, Cl. 73-27.00R.

T. Y. Lin International: *See*—
Chow, Philip Y., 4,389,825, Cl. 52-224.000.

Tabushi, Iwao; Shimokawa, Kazuhiro; Naito, Daiji; Misaki, Susumu; and Yoshida, Tsutomu, to Daikin Kogyo Co., Ltd. Process for preparing fluorobenzene. 4,390,740, Cl. 570-146.000.

Tafara, Peter T.; and Fink, Warren R. High pressure liquid filter vessel. 4,390,425, Cl. 210-232.000.

Taguchi, Tetsuya: *See*—
Hirohata, Michio; Ogawa, Yukio; and Taguchi, Tetsuya, 4,390,262, Cl. 354-230.000.

Tague, Steven A.: *See*—
Negi, Virendra S.; and Tague, Steven A., 4,390,961, Cl. 364-756.000.

Tahara, Kazutoki: *See*—
Sado, Ryoichi; Morikawa, Yoshitusgu; Okamoto, Takekuni; and Tahara, Kazutoki, 4,390,765, Cl. 200-159.00B.

Tajima, Shigeru: *See*—
Nakamura, Tadahiko; Nakano, Kenji; and Tajima, Shigeru, 4,390,908, Cl. 360-70.000.

Takagi, Masayuki, to NSK-Warner K.K. Manually operable attachment for the locking mechanism of safety belt retractor. 4,390,143, Cl. 242-107.40A.

Takahashi, Akira: *See*—
Ohta, Kenji; and Takahashi, Akira, 4,390,600, Cl. 428-621.000.

Takahashi, Naoya: *See*—
Sato, Atsushi; Shimizu, Isoo; and Takahashi, Naoya, 4,390,194, Cl. 282-27.500.

Takahashi, Seigo: *See*—
Sakata, Hideo; and Takahashi, Seigo, 4,389,783, Cl. 33-143.00K.
Sakata, Hideo; and Takahashi, Seigo, 4,389,786, Cl. 33-174.00P.

Takahashi, Toshirou: *See*—
Kobayashi, Hidetoshi; Takahashi, Toshirou; Hirano, Shigeo; Hirosa, Takeshi; and Adachi, Keiichi, 4,390,618, Cl. 430-543.000.

Takahashi, Yuji, to Canon Kabushiki Kaisha. Recording medium feeding device. 4,390,175, Cl. 271-157.000.

Takai, Haruki: *See*—
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, 4,390,536, Cl. 424-246.000.

Takeda, Hitoshi: *See*—
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.

Takeguchi, Masanobu; and Oyobe, Isao, to Marui Industry Co., Ltd. Method of purifying water in fish keeping water tank. 4,390,432, Cl. 210-748.000.

Takemae, Mikio; and Ohkubo, Yuji, to Nippon Kogaku K.K. Flash output control apparatus for camera. 4,390,259, Cl. 354-34.000.

Takemura, Yasuhiko; and Saito, Kazuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic display apparatus having means for detecting the position of an ultrasonic probe. 4,390,025, Cl. 128-660.000.

Takemura, Yasuo: *See*—
Sato, Itsuzo; Ooi, Kazushige; Saito, Kikuo; Takemura, Yasuo; and Shinohara, Toshihiro, 4,390,895, Cl. 358-44.000.

Takenaka, Kiyosi: *See*—
Henmi, Kojiro; and Takenaka, Kiyosi, 4,390,269, Cl. 355-27.000.

Takeuchi, Hidetsugu; Muramatsu, Tsuyoshi; and Kato, Shozo, to Nippondenso Co., Ltd. Method of producing yoke of rotary electric machine. 4,389,871, Cl. 72-356.000.

Takimoto, Kazuaki: *See*—
Danjo, Hiroyuki; Takimoto, Kazuaki; Muta, Gensuke; and Hiroki, Nobuyoshi, 4,390,166, Cl. 266-44.000.

Tamada, Mitsuru: *See*—
Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.

Tamai, Yoshin: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.

Tamglass Oy: *See*—
Reunamaki, Pauli, 4,390,359, Cl. 65-114.000.

Tamura, Kohki: *See*—
Kawana, Hidejiro; Horiba, Tatsuo; Iwamoto, Kazuo; Fujita, Kazunori; and Tamura, Kohki, 4,390,603, Cl. 429-30.000.

Tamura, Koichi: *See*—
Haraikawa, Tetsuo; and Tamura, Koichi, 4,390,084, Cl. 188-71.700.

Tanaami, Kazuo; and Matsuda, Nobuo, to Director-General, Agency of Industrial Science & Technology. High temperature gas distributor for fluidized bed. 4,390,501, Cl. 422-143.000.

Tanabe, Kaoru: *See*—
Shimoda, Haruo; and Tanabe, Kaoru, 4,389,967, Cl. 118-500.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; and Fujimura, Motoki, 4,390,626, Cl. 435-176.000.

Tanaka, Haruhiko: *See*—
Makabe, Hachiro; and Tanaka, Haruhiko, 4,389,954, Cl. 112-158.00E.

Tanaka, Masamichi; and Wada, Hiroto, to Tokyo Shibaura Denki Kabushiki Kaisha. Electret device. 4,390,800, Cl. 307-400.000.

Tanasawa, Yasusi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Direct injection type internal combustion engine with a low pressure fuel injector. 4,389,986, Cl. 123-298.000.

Tanida, Hiroshi: *See*—
Misaki, Susumu; Suefuji, Masahiro; Tsushima, Tadahiko; and Tanida, Hiroshi, 4,390,702, Cl. 546-296.000.

Taniguchi, Hiroshi: *See—*
Furumoto, Mitsunobu; Yano, Osahiko; Taniguchi, Hiroshi; Kubo, Kanji; and Ohtsu, Masamitsu, 4,390,906, Cl. 360-19.100.
Taniguchi, Tokuyuki; Yashima, Iwao; Ota, Masanori; and Sasahara, Hitoshi, to Nissan Chemical Industries, Ltd. Method for removal of fungi formed on hides. 4,390,339, Cl. 8-94.180.
Tanner, Bruno: *See—*
Briner, Emil; Novak, Peter; Tanner, Bruno; and Gasser, Hermann, 4,389,840, Cl. 57-267.000.
Tannery, Edward F.: *See—*
Cox, Walter T.; and Tannery, Edward F., 4,390,195, Cl. 292-53.000.
Tao, Bernard T.: *See—*
Blair, Daniel R.; Lomneth, Richard B.; Prosise, Robert L.; and Tao, Bernard T., 4,390,561, Cl. 426-607.000.
Tarkkanen, Veikko: *See—*
Berthold, Fritz; Kolehmainen, Seppo; and Tarkkanen, Veikko, 4,390,274, Cl. 356-36.000.
Tatsumi, Kazutsune, to Hoya Corporation. Detachable camera filter holder capable of being connected in series with a like filter holder. 4,390,242, Cl. 350-318.000.
Tatters, Ronald; Dolman, John E.; and Howell, Donald R., deceased (by Howell, June E., executrix), to Canada, Her Majesty the Queen in right of, as represented by the Minister of Defence. Reversing low pressure lubricating valve. 4,389,922, Cl. 92-156.000.
Taylor, Aaron S.; and White, Vernon E., to Mobil Solar Energy Corporation. Crystal growth apparatus. 4,390,505, Cl. 422-246.000.
Taylor Freezer Company: *See—*
Schwitters, Stephen W., 4,390,760, Cl. 200-61.040.
Taylor, Junius E., to Engineering & Research Associates, Inc. Circuit for electro mechanical tubing sealer. 4,390,832, Cl. 323-273.000.
Taylor, Lloyd D.: *See—*
Mehta, Avinash C.; Nawn, George H.; and Taylor, Lloyd D., 4,390,613, Cl. 430-219.000.
Taylor, William H., to Hutch Protective Devices Ltd. Latch and lock guard. 4,390,199, Cl. 292-346.000.
Teepak, Inc.: *See—*
Martinek, Thomas W.; and Wilmsen, George M., 4,390,490, Cl. 264-173.000.
Tefertiller, Nancy B.: *See—*
Hoffman, Dwight K.; Harris, Robert F.; Tefertiller, Nancy B.; and Rains, Randall C., 4,390,645, Cl. 521-137.000.
Teich, Wesley W.; and Dudley, Kenneth W., to Raytheon Company. Cook-by-weight microwave oven. 4,390,768, Cl. 219-10.55B.
Tektronix, Inc.: *See—*
Addis, John L., 4,390,852, Cl. 330-300.000.
Telectronics Pty. Ltd.: *See—*
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,390,021, Cl. 128-419.0PG.
Telefonaktiebolaget L M Ericsson: *See—*
Pehrson, Jens E., 4,390,989, Cl. 371-22.000.
Telex Computer Products, Inc.: *See—*
Tharrington, Reginald B., 4,390,795, Cl. 307-143.000.
Telmec Co., Ltd.: *See—*
Imahashi, Issei, 4,390,827, Cl. 318-687.000.
Temp-Trak Inc.: *See—*
Riess, Gordon S., 4,390,016, Cl. 604-236.000.
Tenhaaf, Peter H., to Combustion Engineering, Inc. Wire cloth tensioning apparatus. 4,390,420, Cl. 209-403.000.
Tenneco Chemicals, Inc.: *See—*
Koral, Marvin; and Goodman, Donald, 4,390,459, Cl. 252-511.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem and cepham compounds. 4,390,534, Cl. 424-246.000.
Teranishi, Masayuki; Obase, Hiroyuki; Takai, Haruki; Kubo, Kazuhiro; and Kasuya, Yutaka, to Kyowa Hakko Kogyo Co., Ltd. Piperidine derivatives. 4,390,536, Cl. 424-246.000.
Terao, Toshimi: *See—*
Kondo, Fusao; Terao, Toshimi; Nagano, Katsumasa; and Kitano, Kyozo, 4,390,475, Cl. 260-505.00S.
Terochem Laboratories Ltd.: *See—*
Stokowski, Robert J.; Tertzakian, Gerard; and Ruo, Tomoki C. S., 4,390,708, Cl. 549-229.000.
Tertzakian, Gerard: *See—*
Stokowski, Robert J.; Tertzakian, Gerard; and Ruo, Tomoki C. S., 4,390,708, Cl. 549-229.000.
Tesa, S.A.: *See—*
Zanier, Adriano, 4,389,784, Cl. 33-172.00B.
Teschemacher, Hansjorg: *See—*
Brantl, Victor; Henschen, Agnes; Teschemacher, Hansjorg; and Lottspeich, Friedrich, 4,390,527, Cl. 424-177.000.
Tesser, Murray V.: *See—*
Fernekes, Robert W.; and Tesser, Murray V., 4,390,257, Cl. 353-95.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,390,724, Cl. 562-504.000.
Texaco Inc.: *See—*
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., 4,390,347, Cl. 48-197.00R.
Dille, Roger M.; Middleton, Leigh R.; Brent, Albert; and Robin, Allen M., 4,390,348, Cl. 48-197.00R.
Knifton, John F., 4,390,734, Cl. 568-678.000.
Sherman, Philip B., 4,390,418, Cl. 208-326.000.
Skarlos, Leonidas; and Dille, Roger M., 4,390,957, Cl. 364-550.000.
Sweeney, William M., 4,390,344, Cl. 44-56.000.
Sweeney, William M., 4,390,417, Cl. 208-188.000.
Texas Instruments Incorporated: *See—*
Kay, Brian, 4,390,970, Cl. 365-73.000.
Kuo, Chang-Kiang, 4,390,971, Cl. 365-104.000.
Robinson, John T.; Cecil, Olin B.; and Shah, Rajiv R., 4,390,392, Cl. 156-643.000.
Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., 4,390,885, Cl. 346-140.00R.
Woodside, Robert H.; and Drury, Michael J., 4,390,874, Cl. 340-812.000.
Textima VEB Wirkmaschinenbau Karl-Marx-Stadt Kombinat Textima: *See—*
Schneider, Manfred, 4,389,860, Cl. 66-84.00R.
Textube Corporation: *See—*
Mueller, Rolf J., 4,390,144, Cl. 242-118.300.
Tezuka, Akira: *See—*
Ueda, Toshimichi; Tezuka, Akira; Wakairo, Seiichi; Sakuma, Moriyuki; and Mochizuki, Masashi, 4,389,855, Cl. 62-200.000.
Tharrington, Reginald B., to Telex Computer Products, Inc. A.C. Power control for inductive loads. 4,390,795, Cl. 307-143.000.
Thermocell Development, Ltd.: *See—*
Smith, Stuart B., 4,390,641, Cl. 521-103.000.
Smith, Stuart B., 4,390,642, Cl. 521-112.000.
Theta-J Corporation: *See—*
Rodriguez, Edward T., 4,390,790, Cl. 250-551.000.
Thiele, Willi: *See—*
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,390,029, Cl. 131-109.0AB.
Thoma, Matthias, to Industrie Chemie Thoma GmbH & Co. Produktions KG. Process for the production of guanidine nitrate from a mixture of urea and ammonium nitrate and apparatus for its performance. 4,390,726, Cl. 564-242.000.
Thomas, Kenneth C.; Jones, Eric D.; and McBride, Marvin A., to United States of America, Energy. Fusion welding process. 4,390,777, Cl. 219-127.000.
Thomas, Reese R.: *See—*
Pickens, Robert C., Jr.; Thomas, Reese R.; and Ellicson, John W., 4,390,582, Cl. 428-85.000.
Thompson, Dennis C.: *See—*
Robbins, Arthur J.; Robbins, Paul B.; and Thompson, Dennis C., 4,390,111, Cl. 220-259.000.
Thompson, Floyd M., Jr., to Crutcher Resources Corporation. Piling removal. 4,389,765, Cl. 29-426.500.
Thompson, Morice W.: *See—*
Graetz, Clive W.; Thompson, Morice W.; and Bromley, Charles, 4,390,658, Cl. 524-512.000.
Thompson, Thomas M. Continuous miner with cutter assembly attitude adjustment. 4,390,211, Cl. 299-57.000.
Thomson-CSF: *See—*
Fourcade, Pierre; and Dupray, Dominique, 4,390,985, Cl. 370-94.000.
Hareng, Michel; Le Berre, Serge; Leclerc, Pierre; and Perbet, Jean Noel, 4,390,244, Cl. 350-333.000.
Marcy, Raymond, 4,390,951, Cl. 364-436.000.
Thorpe, Frank P.; and Calhoun, L. Owen, to CTS Corporation. Junction box. 4,390,106, Cl. 220-3.700.
Thorson, Clayton W., to Eaton Corporation. Rotary fluid pressure device and valve-seating mechanism therefor. 4,390,329, Cl. 418-61.00B.
Threadgold, Alan C.: *See—*
Courtney, Robert W.; Parker, Stephen J.; and Threadgold, Alan C., 4,390,615, Cl. 430-315.000.
Tibbetts, Forest S. Ashtray. 4,390,030, Cl. 131-231.000.
Tichner, Cline A.: *See—*
Schwartz, Ellen S.; and Tichner, Cline A., 4,390,440, Cl. 252-76.000.
Tiebout, Ralph H., III. Violin and viola bridge. 4,389,917, Cl. 84-309.000.
Tilles, Harvey G. Athletic shoe. 4,389,798, Cl. 36-129.000.
Timex Corporation: *See—*
Houlihan, John T., 4,390,289, Cl. 368-286.000.
Tincher, Cline A.: *See—*
Schwartz, Ellen S.; and Tincher, Cline A., 4,390,439, Cl. 252-73.000.
Ting, Joseph W., to California Institute of Technology. Integration filter for step waveforms. 4,390,844, Cl. 328-142.000.
Tiret, Bernard: *See—*
Biava, Dominique; Cornu, Jean; Detriche, Jean-Marie; Galera, Richard; Tiret, Bernard; and Marchal, Paul, 4,390,775, Cl. 219-124.340.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,390,671, Cl. 526-125.000.
Tobiki, Hisao: *See—*
Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, 4,390,535, Cl. 424-246.000.
Tobin, Curtis L.: *See—*
Haas, Rudy E.; Smorol, Michael E.; Tobin, Curtis L.; and Walker, James J., Jr., 4,390,059, Cl. 165-76.000.
Todo, Akira: *See—*
Yatsu, Tadao; Todo, Akira; and Sotoyama, Toshiki, 4,390,683, Cl. 528-194.000.
Togashi, Takao: *See—*
Yoshimura, Isao; and Togashi, Takao, 4,390,587, Cl. 428-215.000.

Tohi, Yasusuke: *See—*
Murata, Naoaki; Yoshioka, Masahiro; Hayashi, Kiyoshi; and Tohi, Yasusuke, 4,390,264, Cl. 355-8.000.

Toivonen, Thomas N. Calculator for determining optimum tone reproduction. 4,390,778, Cl. 235-89.00R.

Tokico Ltd.: *See—*
Haraikawa, Tetsuo; and Tamura, Koichi, 4,390,084, Cl. 188-71.700.
Maeda, Koichi, 4,390,187, Cl. 280-6.00R.

Tokitsu, Naoki, to Nippondenso Co., Ltd. Magnetic card recording apparatus. 4,390,905, Cl. 360-2.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Arimura, Yoshiaki, 4,390,955, Cl. 364-490.000.
Biwa, Takeshi, 4,390,810, Cl. 313-500.000.
Fujiwara, Tatsuo, 4,390,907, Cl. 360-32.000.
Koike, Hideharu, 4,390,803, Cl. 307-578.000.
Morooka, Shinichi, 4,389,888, Cl. 73-299.000.
Ogita, Yasuhiro; Kawasaki, Kazuya; Nagao, Kouichi; and Mori, Naoki, 4,390,854, Cl. 62-157.000.
Sato, Itsu[illegible]Joi, Kazushige; Saito, Kikuo; Takemura, Yasuo; and Shinohara, Toshihiro, 4,390,895, Cl. 358-44.000.
Takemura, Yasuhiko; and Saito, Kazuyoshi, 4,390,025, Cl. 128-660.000.
Tanaka, Masamichi; and Wada, Hiroto, 4,390,800, Cl. 307-400.000.
Uchida, Kohachi, 4,390,266, Cl. 355-14.00E.
Yamada, Hisashi; and Sugawara, Tsutomu, 4,390,847, Cl. 330-51.000.

Tomita, Hitoshi: *See—*
Aoki, Hachiro; Tomita, Hitoshi; and Nagamata, Kiyoshi, 4,389,998, Cl. 123-502.000.

Tonooka, Keisuke: *See—*
Wakamatsu, Atsuyuki; and Tonooka, Keisuke, 4,390,135, Cl. 241-101.200.

Toray Industries, Inc.: *See—*
Oka, Ken-ichiro; Mineo, Masatoshi; and Ono, Terumichi, 4,390,685, Cl. 528-272.000.
Okamoto, Miyoshi; Yoshida, Syusuke; and Kurata, Nobuo, 4,390,572, Cl. 428-15.000.
Umezawa, M[illegible]; and Okamoto, Miyoshi, 4,390,566, Cl. 427-198.000.

Torenbeek, Reinder: *See—*
Havinga, Reginoldus; Torenbeek, Reinder; and Schreurs, Petrus H. M., 4,390,451, Cl. 252-311.000.

Tosa, Tetsuya: *See—*
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; and Fujimura, Motoki, 4,390,626, Cl. 435-176.000.

Toscano, Luciano: *See—*
Riva, Mario; and Toscano, Luciano, 4,390,533, Cl. 424-243.000.

Toto, Ltd.: *See—*
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,389,738, Cl. 4-420.200.

Toyo Kogyo Co., Ltd.: *See—*
Fujimoto, Misao, 4,390,001, Cl. 123-571.000.
Izuno, Sadami; Kiyomitsu, Isao; and Tsuji, Toshihiko, 4,390,209, Cl. 297-410.000.
Kodama, Hiroshi; and Seto, Tadayuki, 4,390,330, Cl. 418-97.000.
Sakamoto, Toshinori, 4,389,818, Cl. 49-349.000.

Toyoda, Minoru, to Aisin Seiki Company, Limited. Key holder. 4,389,864, Cl. 70-456.00R.

Toyota Jidosha Kabushiki Kaisha: *See—*
Noro, Shuhei; and Naito, Tadashi, 4,389,882, Cl. 73-118.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Igashira, Toshihiko; Nomura, Ken; Abe, Seiko; and Ishida, Yasuhiko, 4,390,000, Cl. 123-549.000.
Koide, Toshikazu; and Yaegashi, Takehisa, 4,389,995, Cl. 123-491.000.
Nakano, Jiro; and Miyagi, Hideo, 4,389,997, Cl. 123-492.000.
Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,389,992, Cl. 123-419.000.
Yaegashi, Takehisa; and Kinugasa, Yukio, 4,389,996, Cl. 123-491.000.

Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; and Yamada, Toshihiko, 4,390,003, Cl. 126-96.000.

Transaction Control Industries: *See—*
Converse, Merle E.; and Darilek, Glenn T., 4,390,828, Cl. 320-32.000.

Transformatoren Union Aktiengesellschaft: *See—*
Schulzer, Odilo, 4,390,858, Cl. 336-92.000.

Transway International Corporation: *See—*
Fletcher, Edwin H., 4,389,960, Cl. 114-248.000.

Trautlein, Fred S.; and Stephens, James R., to General Mills Products Corp. Display stand for jewelry articles. 4,390,099, Cl. 211-4.000.

Treiber, Fritz F.: *See—*
Margraf, Dallas A.; and Treiber, Fritz F., 4,390,390, Cl. 156-566.000.

Treiber, Horst: *See—*
Resag, Jorg; Goldner, Walther; and Treiber, Horst, 4,390,207, Cl. 297-362.000.

Tremblay, Gilles: *See—*
Drouin, Gilbert; Lacoste, Jean; and Tremblay, Gilles, 4,389,913, Cl. 81-53.200.

Trembly, Gray C.; Goldberg, Ernest; and Dragun, Edward B., to Raytheon Company. Antipersonnel mine. 4,389,940, Cl. 102-489.000.

Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Chant, Bernard J.; Ouwerkerk, Anton V.; Kamath, Venkatesh; and Mussinan, Cynthia J., 4,390,444, Cl. 252-174.110.

Tri-State Oil Tool Industries, Inc.: *See—*
Richardson, Charles N., 4,390,065, Cl. 166-181.000.

Trico Products Corporation: *See—*
Riester, William C., 4,389,747, Cl. 15-250.420.

Tridon Limited: *See—*
Kimber, Edward G., 4,389,746, Cl. 15-250.320.

Trihey, John M., to Vulcan Australia Limited. Reflective trough structure. 4,390,241, Cl. 350-296.000.

Trio Kabushiki Kaisha: *See—*
Kurata, Hirotaka; and Yoshida, Shiro, 4,390,801, Cl. 307-409.000.

Troiani, Nicola: *See—*
Gozzo, Franco; Troiani, Nicola; Lorusso, Simone; and Santi, Romano, 4,390,705, Cl. 549-3.000.

TRW Inc.: *See—*
Mathew, Moni G.; and Weisz, Thomas J., 4,390,853, Cl. 333-1.100.
Reeves, Jeffrey R., 4,389,762, Cl. 29-25.420.
Valdiserri, Leo L.; and Woodbury, Richard P., 4,390,696, Cl. 544-214.000.

Tsuchiya, Hiroaki: *See—*
Matsui, Kunio; Tsuchiya, Hiroaki; and Suzuki, Ryushi, 4,390,351, Cl. 55-204.000.

Tsuda, Takeshi: *See—*
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Morita, Satoshi, 4,390,737, Cl. 568-804.000.

Tsuji, Toshihiko: *See—*
Izuno, Sadami; Kiyomitsu, Isao; and Tsuji, Toshihiko, 4,390,209, Cl. 297-410.000.

Tsukiyama, Nobuyoshi; and Ichige, Ryo, to Hitachi, Ltd. Ferrite electrode material. 4,390,461, Cl. 252-519.000.

Tsurumi, Yoshihiro: *See—*
Kanada, Toshiaki; Suzuki, Kazuhiro; Yoshioka, Hiroshi; Maeda, Kenji; and Tsurumi, Yoshihiro, 4,390,643, Cl. 521-117.000.

Tsushima, Tadahiko: *See—*
Misaki, Susumu; Suefuji, Masahiro; Tsushima, Tadahiko; and Tanida, Hiroshi, 4,390,702, Cl. 546-296.000.

Tully, Wilfred R., to Roussel Uclaf. Process for the preparation of triazoloquinazolinones. 4,390,697, Cl. 544-251.000.

Tung, William C. T., to Goodyear Tire & Rubber Company, The. High melt strength elastometric copolyesters. 4,390,687, Cl. 528-295.000.

Turner, E. Wayne, to Hardigg Industries, Inc. Method and apparatus for bonding thermoplastic materials. 4,390,384, Cl. 156-221.000.

Tutt, Kingsley J.: *See—*
Peck, Alan M.; Tutt, Kingsley J.; and Mansfield, Graham J., 4,389,861, Cl. 69-6.500.

Twibell, Jerome J.; and Crawford, Knute S., to Honeywell Information Systems Inc. Interface apparatus for data transfer through an input-/output multiplexer from plural CPU subsystems to peripheral subsystems. 4,390,943, Cl. 364-200.000.

Tyler Refrigeration Corporation: *See—*
Abraham, Fayez F., 4,389,852, Cl. 62-82.000.
Ibrahim, Fayez F., 4,389,856, Cl. 62-248.000.

Tysver, Oliver J., to Continental Group, Inc., The. Easy opening container and opener tool therefor. 4,390,112, Cl. 220-274.000.

Tyszkiewicz, Theodore J.: *See—*
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., 4,390,463, Cl. 252-522.00R.

Tzeng, Chin-Pyng J., to Rockwell International Corporation. Voltage regulator circuit. 4,390,833, Cl. 323-280.000.

Tzodikov, Nathan R.: *See—*
O'Brien, Robert E.; and Tzodikov, Nathan R., 4,390,517, Cl. 424-1.000.

Uberti, Jean-Louis: *See—*
Golay, Jean-Pierre; and Uberti, Jean-Louis, 4,389,937, Cl. 102-249.000.

Uchida, Kazuo, to Diesel Kiki Co., Ltd. Double-injection type fuel injection valve. 4,390,129, Cl. 239-533.500.

Uchida, Keiichi: *See—*
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.

Uchida, Kohachi, to Tokyo Shibaura Denki Kabushiki Kaisha. Exposure apparatus for electronic duplicator. 4,390,266, Cl. 355-14.00E.

Uchidoi, Masanori: *See—*
Yamamoto, Hiroshi; and Uchidoi, Masanori, 4,390,261, Cl. 354-173.000.

Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, to Richter Gedeon Vegyeszeti Gyar RT. Method for controlling the amount and distribution of alkaloids formed in a fermentation process. 4,390,625, Cl. 435-119.000.

Ueda, Toshimichi; Tezuka, Akira; Wakairo, Seiichi; Sakuma, Moriyuki; and Mochizuki, Masashi, to Hitachi, Ltd. Dual air-conditioner for motor-cars. 4,389,855, Cl. 62-200.000.

Ueno, Hiroshi: *See—*
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,390,671, Cl. 526-125.000.

Uetrecht, Dale M.; and Simmons, Carlton J., Jr., to Baldwin Piano & Organ Company. Chord identification system for electronic musical instruments. 4,389,914, Cl. 84-1.010.

Ulch, B. G.: *See*—
Reinke, Nelson A.; and Ulch, B. G., 4,390,060, Cl. 165-76.000.
Umemura, Izumi: *See*—
Nohda, Masao; Umemura, Izumi; and Arai, Toshiyuki, 4,390,255, Cl. 351-212.000.
Umezawa, Masao; and Okamoto, Miyoshi, to Toray Industries, Inc. Method of producing soft sheet. 4,390,566, Cl. 427-198.000.
Unarco Industries, Inc.: *See*—
Daily, Virgil W., III, 4,390,002, Cl. 126-25.00R.
Unger, Karin: *See*—
Mathuni, Josef; and Unger, Karin, 4,390,394, Cl. 156-643.000.
Unie Van Kunstmestfabrieken, B.V.: *See*—
Willems, Michael H.; and Klok, Jan W., 4,390,483, Cl. 264-7.000.
Union Carbide Corporation: *See*—
Evans, William P.; and Leger, Violeta Z., 4,390,604, Cl. 429-197.000.
Union Oil Company of California: *See*—
Dvoracek, Louis M.; Fischer, Paul W.; and Skripek, Milan, 4,390,412, Cl. 208-48.00R.
Union Special G.m.b.H.: *See*—
von Hagen, Wolf R., 4,389,951, Cl. 112-121.270.
U.S. Clinical Products, Inc.: *See*—
Cummings, Robert, 4,390,104, Cl. 215-232.000.
United States of America
Agriculture: *See*—
Jennings, Daniel T.; Carniglia, Charles K.; and Young, David B., 4,390,787, Cl. 250-459.100.
Walker, Harrell L., 4,390,360, Cl. 71-79.000.
Air Force: *See*—
Colvin, Roger D., 4,390,854, Cl. 333-193.000.
Noble, Milton L.; and Hoefer, William G., 4,390,816, Cl. 315-370.000.
Army: *See*—
King, Paul V.; Becher, Albert F.; and Henderson, Wilmer P., 4,389,947, Cl. 109-1.00S.
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Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,390,405, Cl. 204-415.000.
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van Leeuwen, Johannes, to Esmil B.V. Apparatus for scraping sludge from the surface of a body of liquid. 4,390,430, Cl. 210-527.000.
Van Valkenburg, Constance M. Through-the-wall air conditioner cover kit. 4,389,827, Cl. 52-511.000.
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Reip, Raymond G., 4,390,041, Cl. 137-488.000.
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Krasnov, Igor, 4,389,760, Cl. 24-263.00D.
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Winsel, August, 4,390,447, Cl. 252-182.100.
Veith, Dieter, to Winkler & Dunnebier Maschinenfabrik und Eisengieserei GmbH & Co. Control head for controlling the suction path of a suction roller. 4,390,174, Cl. 271-108.000.
Vereinigte Flugtechnische Werke GmbH: *See*—
Behnert, Reinhard, 4,389,842, Cl. 60-39.360.
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Vincent, Arthur L., to International Telephone & Telegraph. Method and apparatus for recovering elemental sulfur. 4,390,515, Cl. 423-573.00G.
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Vitale, Nicholas G.: *See*—
Ackermann, Robert A.; and Vitale, Nicholas G., 4,389,844, Cl. 60-517.000.
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Buchholz, Hagen; Johannsmeier, Hans-Dieter; and Vock, Friedrich, 4,390,126, Cl. 239-1.000.

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Vogel, Claude: *See*—
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von Bonin, Wulf, to Bayer Aktiengesellschaft. Maleic acid anhydride copolymers and their preparation. 4,390,672, Cl. 526-209.000.

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Votava, Werner F., to Ferro Corporation. Glass frit of diopside crystal precursors. 4,390,636, Cl. 501-24.000.

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Bolick, Stephen M.; and Vought, John O., 4,389,890, Cl. 73-431.000.

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Trihey, John M., 4,390,241, Cl. 350-296.000.

W-K-M Wellhead Systems, Inc.: *See*—
Wells, Frederic D., Jr., 4,390,063, Cl. 166-84.000.

W. R. Grace & Co.: *See*—
Ritter, Ronald E.; and Henderson, Donald S., 4,390,416, Cl. 208-120.000.
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,390,456, Cl. 252-448.000.

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Ferguson, Daniel J.; Stringer, Frederick D.; and Esakov, Michael D., 4,390,385, Cl. 156-229.000.

W. R. Weaver Co.: *See*—
Ackerman, William R., 4,389,791, Cl. 33-246.000.

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Perkins, Lawrence B., 4,390,037, Cl. 137-240.000.

Wack, Geza: *See*—
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Weise, Carlos; Wolfer, Dietrich; and Patzke, Jorg, 4,390,656, Cl. 524-493.000.

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Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,390,547, Cl. 424-304.000.

Wadu, Hiroto: *See*—
Tanaka, Masamichi; and Wada, Hiroto, 4,390,800, Cl. 307-400.000.

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Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,390,671, Cl. 526-125.000.

Wada, Yasushi: *See*—
Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.

Waddan, Dhafir Y.; and Williams, Derek, to Imperial Chemical Industries PLC. Process for the oxidation of olefinic compounds to olefine oxides or derivatives thereof. 4,390,738, Cl. 568-857.000.

Wade, Peter C.: *See*—
Krapcho, John; and Wade, Peter C., 4,390,695, Cl. 544-130.000.

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Heep, Dieter, 4,389,949, Cl. 110-101.0CF.

Wagner, Burkhard E.: *See*—
Karol, Frederick J.; Goeke, George L.; Wagner, Burkhard E.; Fraser, William A.; Jorgensen, Robert J.; and Friis, Nils, 4,390,677, Cl. 526-348.600.

Wagner, Hans-Ruedi. Container for articles of daily use, having two enclosable chambers. 4,390,217, Cl. 312-205.000.

Wagner, Rudolf M.: *See*—
Merk, Wolfgang; Wagner, Rudolf M.; Werle, Peter; and Nygren, Robert S., 4,390,732, Cl. 568-648.000.

Wagner Spray Tech Corporation: *See*—
Karliner, Rudolf, 4,390,324, Cl. 417-282.000.

Wagner, Wilbert A. Trailer gooseneck apparatus. 4,390,192, Cl. 280-425.00A.

Wakairo, Seiichi: *See*—
Ueda, Toshimichi; Tezuka, Akira; Wakairo, Seiichi; Sakuma, Moriyuki; and Mochizuki, Masashi, 4,389,855, Cl. 62-200.000.

Wakamatsu, Atsuyuki; and Tonooka, Keisuke, to Daiwa Can Company, Limited. Bag removal apparatus. 4,390,135, Cl. 241-101.200.

Wake, Shigeo: *See*—
Inoue, Yasuhiko; Wake, Shigeo; Sirafuji, Tamio; and Beppu, Masazo, 4,390,736, Cl. 568-801.000.

Walinsky, Stanley W., to Pfizer Inc. Acrylate/maleate copolymers, their preparation and use as antiscalants. 4,390,670, Cl. 526-79.000.

Walker, Harrell L., to United States of America, Agriculture. Control of sicklepod, showy crotalaria, and coffee senna with a fungal pathogen. 4,390,360, Cl. 71-79.000.

Walker, James J., Jr.: *See*—
Haas, Rudy E.; Smorol, Michael E.; Tobin, Curtis L.; and Walker, James J., Jr., 4,390,059, Cl. 165-76.000.

Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Imidazodiazepines and processes therefor. 4,390,471, Cl. 260-244.400.

Walsh, Thomas J.: *See*—
McClenahan, Robert W.; and Walsh, Thomas J., 4,390,796, Cl. 307-261.000.

Walter, Bert, to Miles Laboratories, Inc. Multilayer analytical element having an impermeable radiation diffusing and blocking layer. 4,390,343, Cl. 436-518.000.

Walters, Paul W.; Benslay, Roger M.; and Barger, Dwight F., to Ashland Oil, Inc. Carbometallic oil conversion with ballistic separation. 4,390,503, Cl. 422-147.000.

Walz, Gerd; Wirth, Thaddaus; and Sprenger, Walter, to Hoechst Aktiengesellschaft. Water-dilutable polyester, process for the preparation thereof and the use thereof. 4,390,688, Cl. 528-295.300.

Wanst, David J., to General Electric Company. Food processor. 4,390,133, Cl. 241-93.000.

Wand, Robert L.: *See*—
Shah, Gautam N.; Brown, Michael R.; Lee, Edward C.; Hook, Gerald C.; Wand, Robert L.; Ratliff, Charles R.; and McClure, Virge W., 4,390,885, Cl. 346-140.00R.

Ward, Geoffrey M.: *See*—
Sands, Raymond L.; and Ward, Geoffrey M., 4,389,948, Cl. 109-82.000.

Ward, Ian M.; and McGrath, John C., to National Research Development Corporation. Uniaxially drawn vinylidene fluoride polymers. 4,390,674, Cl. 526-255.000.

Ward, John M., to Shell Oil Company. Internal pipeline plug for deep subsea operations. 4,390,043, Cl. 138-89.000.

Warshawsky, Jerome, to I. W. Industries, Inc. Multiple position lamp. 4,390,933, Cl. 362-270.000.

Watanabe, Ichiro; Enomoto, Kanehiko; and Ogawa, Yasuo, to Nitto Chemical Industry Co., Ltd. Process for producing bacteria having high nitrilase activity. 4,390,631, Cl. 435-244.000.

Watanabe, Katsunori: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; and Kitahara, Makoto, 4,390,611, Cl. 430-59.000.

Watanabe, Masaru: *See*—
Mori, Teruo; Shirai, Hiroshi; Kakei, Tsutomu; Watanabe, Masaru; and Matsuhisa, Tsuneyasu, 4,390,407, Cl. 204-206.000.

Watanabe, Minoru: *See*—
Matsui, Takahiro; and Watanabe, Minoru, 4,390,932, Cl. 362-269.000.

Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, to Solex Research Corporation of Japan. Process for recovery of aluminum oxide from aluminum compounds containing fluorine. 4,390,508, Cl. 423-112.000.

Watanabe, Nobuatsu: *See*—
Watanabe, Morio; Nishimura, Sanji; and Watanabe, Nobuatsu, 4,390,508, Cl. 423-112.000.

Watanabe, Seizo, to Olympus Optical Co., Ltd. Device for detecting edge of magnetic tape for recording signals. 4,390,917, Cl. 360-128.000.

Watanabe, Tohru: *See*—
Morita, Yoshinori; Hayata, Shinzi; Kato, Akifumi; Nara, Hideo; and Watanabe, Tohru, 4,390,669, Cl. 526-65.000.

Watanabe, Tomoyuki: *See*—
Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,389,992, Cl. 123-419.000.

Watase, Kenta: *See*—
Hirakura, Koji; Sawada, Yasuo; Watase, Kenta; and Iijima, Takeshi, 4,389,972, Cl. 118-691.000.

Watatani, Minoru, to S. I. Handling Systems, Inc. Transfer truck. 4,389,943, Cl. 104-166.000.

Watkins, Hugh: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,390,434, Cl. 252-8.600.
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hamus, Marie R., 4,390,435, Cl. 252-8.600.

Watzke, Franz, to Siemens Aktiengesellschaft. Contact piece for an electric vacuum switch. 4,390,762, Cl. 200-144.00B.

Wave-Rider, Inc.: *See*—
Cudmore, Patrick J., 4,390,148, Cl. 244-19.000.

Wavin B.V.: *See*—
van Dongeren, Jan P., 4,390,383, Cl. 156-196.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Lutz, Alfons; and Kohlpainter, Georg, 4,390,203, Cl. 296-223.000.

Weber, Klaus: *See*—
Biedermann, Ernst; Findeis, Gunter; Weber, Klaus; and Zahn, Wolfgang, 4,390,270, Cl. 355-46.000.

Weber, Robert N.: *See*—
Showman, Robert L.; and Weber, Robert N., 4,390,224, Cl. 339-75.0MP.

Webster, David F., to Nomode Incorporated. Determination of the extent of a decubitus ulcer. 4,389,782, Cl. 33-1.0BB.

Webster, Jerald H. Strap winding mechanism. 4,390,141, Cl. 242-86.50R.

Wechsler, Bernard. Ratio control system. 4,390,822, Cl. 318-114.000.

Weeks, Paul D.; and Allingham, Robert P., to Pfizer Inc. Preparation of gamma-pyrones. 4,390,709, Cl. 549-418.000.

Wehner, Wolfgang; Farooq, Saleem; and Kostler, Hans-Gunter, to Ciba-Geigy Corporation. Pesticidal triorgano-tin triazines. 4,390,538, Cl. 424-249.000.

Weiler, Wolfgang, to MTU Motoren-und Turbinen-Union Muenche GmbH. Apparatus for operating shut-off members in gas turbine engines, particularly in turbojet engines. 4,390,318, Cl. 415-145.000.

Weinberger, Harold. Heavy duty liquid detergent. 4,390,466, Cl. 252-548.000.

Weinstein, Myron: *See*—
Balogh, Louis J.; Fitzhugh, Raymond L.; Kimes, Dale S.; and Weinstein, Myron, 4,389,788, Cl. 33-178.00D.
Weisdorfer, Leo: *See*—
Craggs, Harold B.; and Weisdorfer, Leo, 4,389,795, Cl. 34-103.000.
Weise, Carlos; Wolfer, Dietrich; and Patzke, Jorg, to Wacker-Chemie GmbH. Flame-resistant molding compositions. 4,390,656, Cl. 524-493.000.
Weiss, Jonas; and Seltzer, Raymond, to Ciba-Geigy Corporation. Latent urethane resin systems. 4,390,679, Cl. 528-64.000.
Weissbuch, Isabela: *See*—
Lahav, Meir; Addadi, Lia; and Weissbuch, Isabela, 4,390,722, Cl. 562-402.000.
Weisz, Thomas J.: *See*—
Mathew, Moni G.; and Weisz, Thomas J., 4,390,853, Cl. 333-1.100.
Welch, Cletus N.: *See*—
Loehr, Clifford E.; Crawford, Roger A.; Carbaugh, John E.; and Welch, Cletus N., 4,390,512, Cl. 423-474.000.
Weldon, Howard; and Stoker, James. Garbage can and lid holder. 4,390,155, Cl. 248-507.000.
Wells, Frederic D., Jr., to W-K-M Wellhead Systems, Inc. Geothermal wellhead packing assembly. 4,390,063, Cl. 166-84.000.
Wendt, Frank S.: *See*—
Babcock, William E.; and Wendt, Frank S., 4,390,819, Cl. 315-411.000.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Sigrist, Hugo, 4,389,938, Cl. 102-337.000.
Werle, Peter: *See*—
Merk, Wolfgang; Wagner, Rudolf M.; Werle, Peter; and Nygren, Robert S., 4,390,732, Cl. 568-648.000.
Werner, Franz: *See*—
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Wessel, Otto, to Mannesmann Aktiengesellschaft. Pressing metal powder into shapes. 4,390,488, Cl. 419-66.000.
Westates Space-Era Products, Inc. dba Wespac: *See*—
Castro, Albert J., 4,390,294, Cl. 400-196.100.
Westermark, Olle: *See*—
Kardos, Karl; Mattsson, Bertil; and Westermark, Olle, 4,390,004, Cl. 126-104.00A.
Western Electric Company, Incorporated: *See*—
Cassidy, Michael P.; D'Amico, John F.; DeAngelo, Michael A., Jr.; and Lin, Kon-Mang, 4,389,771, Cl. 29-846.000.
Hammond, Charles S., Jr.; and Mitchell, Henry D., Jr., 4,390,137, Cl. 242-54.00R.
Lien, Suei-Yuen P., 4,390,379, Cl. 148-171.000.
Myers, Daryl L.; and Rice, Stanley, 4,390,357, Cl. 65-2.000.
Smithgall, David H., Sr., 4,390,897, Cl. 358-101.000.
Westinghouse Electric Corp.: *See*—
Hruda, Robert M., 4,390,763, Cl. 200-144.00B.
Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,390,042, Cl. 138-89.000.
Stacey, Eric J., 4,390,938, Cl. 363-54.000.
Weston, Charles W.; and O'Neill, Padraic S., to Agrico Chemical Company. Process for manufacturing ammonium phosphate utilizing an oxalic acid acidulating process. 4,390,509, Cl. 423-313.000.
Weterings, Cornelis A. M.; and Janssen, Johannes A., to Stamicarbon, B.V. Process for recovering yttrium and lanthanides from wet-process phosphoric acid. 4,390,507, Cl. 423-8.000.
White, Vernon F.: *See*—
Taylor, Aaron S.; and White, Vernon E., 4,390,505, Cl. 422-246.000.
White, William H.; Harbison, William C.; and Nelson, Gary L., to Swedlow, Inc. Transparent abrasion resistant filled organo-polysiloxane coatings containing colloidal antimony oxide and colloidal silica. 4,390,373, Cl. 106-287.120.
Whitener, Philip C., to Boeing Company, The. Tandem wing airplane. 4,390,150, Cl. 244-45.00R.
Whitfield, Richard G.: *See*—
Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 4,390,369, Cl. 106-31.000.
Whitlock, Dellas M., to Ashland Oil, Inc. Tool for restoring roundness to metal tubing. 4,389,867, Cl. 72-126.000.
Whitney, LeRoy E. Tack pliers. 4,390,050, Cl. 145-46.000.
Whitwam, Ronald L.: *See*—
Faiks, Frederick S.; Pergler, Charles C.; Whitwam, Ronald L.; Knoblauch, Jack R.; Beukema, Duane M.; and Hozeski, Kenneth W., 4,390,206, Cl. 297-300.000.
Wicki, Heinz; and Vogel, Claude, to Sandoz Ltd. Tetrakisazo dyes containing a stilbenylene or 2,2'-disulfostilbenylene radical. 4,390,470, Cl. 260-166.000.
Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Reduction of cyclopentadiene from isoprene streams. 4,390,742, Cl. 585-854.000.
Widmer, Paul; and Mercer, Robert R., to General Motors Corporation. Inertia responsive seat back latching mechanism. 4,390,208, Cl. 297-379.000.
Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Wiechert, Rudolf; Annen, Klaus; Laurent, Henry; and Beier, Sybille, 4,390,530, Cl. 424-238.000.
Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Electrophotographic recording material with abrasion resistant overcoat. 4,390,609, Cl. 430-58.000.
Wier, John P.; and Garrett, Robert A., to United States of America, Navy. Integrated wheelchair and ambulator. 4,390,076, Cl. 180-11.000.
Wiessner, Edgar, to Siemens Aktiengesellschaft. Coding switch. 4,390,757, Cl. 200-11.00G.
Wilbur, Clayton V.: *See*—
Gaitos, Janise N.; Shattuck, Meredith D.; and Wilbur, Clayton V., 4,390,297, Cl. 400-697.100.
Wilchek, Meir: *See*—
Gorecki, Marian; Acquaye, Clemenceau T. A.; Wilchek, Meir; and Rich, Alexander, 4,390,526, Cl. 424-177.000.
Wilck, Manfred O.: *See*—
Bottcher, Bodo K.; and Wilck, Manfred O., 4,390,745, Cl. 174-73.00R.
Wilgus, William D.; and Backes, Earl L., to Ball Corporation. Automatic closure reject from upstacking device. 4,390,098, Cl. 209-571.000.
Wilhelm, John J.: *See*—
Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,390,042, Cl. 138-89.000.
Willems, Michael H.; and Klok, Jan W., to Unie Van Kunstmestfabrieken, B.V. Method for making urea prills and urea prills obtained by applying this method. 4,390,483, Cl. 264-7.000.
William, Robert: *See*—
Sharrock, Michael; Fry, Donovan N.; and William, Robert, 4,389,801, Cl. 40-159.000.
Williams, Derek: *See*—
Waddan, Dhafir Y.; and Williams, Derek, 4,390,738, Cl. 568-857.000.
Williams, Edwin H.: *See*—
Wood, Leonard J.; Parasuraman, Balakrishna; Williams, Edwin H.; Alexander, Mark G.; and Montgomery, Richard C., Jr., 4,390,981, Cl. 370-56.000.
Williams, Frederick P.: *See*—
Brister, Eseas E.; and Williams, Frederick P., 4,390,577, Cl. 428-42.000.
Williams, Marguerite R. Maternity brassiere. 4,390,024, Cl. 128-460.000.
Williams, Phillip G.: *See*—
Strahan, Robert M.; Hopf, Philip W.; and Williams, Phillip G., 4,390,193, Cl. 280-777.000.
Williams, William H.; and Burke, Michael G., to International Telephone and Telegraph Corporation. Digital PBX system. 4,390,982, Cl. 370-67.000.
Williamson, John P. H.; and Moilliet, John L., to Rhone-Poulenc Industries. Glass polishing processes. 4,389,819, Cl. 51-317.000.
Willing, Achim, to Auer-Sog Glaswerke GmbH. Signal lamp. 4,390,934, Cl. 362-291.000.
Willis, Donald H., to RCA Corporation. Television receiver ferroresonant load power supply disabling circuit. 4,390,820, Cl. 315-411.000.
Willman, Bertram T., to Exxon Production Research Co. Method of treating reservoirs containing very viscous crude oil or bitumen. 4,390,067, Cl. 166-245.000.
Wilmsen, George M.: *See*—
Martinek, Thomas W.; and Wilmsen, George M., 4,390,490, Cl. 264-173.000.
Wilson, Rosser S., to Ball Corporation. Phase-lock oscillator. 4,390,910, Cl. 360-77.000.
Wilt, Donna F.: *See*—
Beningfield, Harley W.; and Wilt, Donna F., 4,390,949, Cl. 364-429.000.
Winckelhaus, Werner. Friction connection between a wheel and a shaft with force indicator. 4,390,301, Cl. 403-27.000.
Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co.: *See*—
Veith, Dieter, 4,390,174, Cl. 271-108.000.
Winning, John K. Circular saw sharpening attachment. 4,389,911, Cl. 76-74.000.
Winsel, August, to Varta Batterie Aktiengesellschaft. Manufacturing process for nickel (II) hydroxide. 4,390,447, Cl. 252-182.100.
Wirth, Thaddaus: *See*—
Walz, Gerd; Wirth, Thaddaus; and Sprenger, Walter, 4,390,688, Cl. 528-295.300.
Wisniewski, Joseph M.; and Mrotz, Walter C., III, to Haworth Mfg., Inc. Blind connecting structure for inner and outer shells of chair back. 4,390,210, Cl. 297-452.000.
Wissner, Allan: *See*—
Grudzinskas, Charles V.; Chen, Sow-Mei L.; and Wissner, Allan, 4,390,711, Cl. 549-465.000.
Witchell, Stanley P. Air filters. 4,390,354, Cl. 55-337.000.
Woebcke, Herman N.: *See*—
Gartside, Robert J.; and Woebcke, Herman N., 4,390,502, Cl. 422-145.000.
Wolfer, Dietrich: *See*—
Weise, Carlos; Wolfer, Dietrich; and Patzke, Jorg, 4,390,656, Cl. 524-493.000.
Woltz, Stephen H., to Motorola, Inc. Low-voltage, high-noise immunity I^2L interface. 4,390,802, Cl. 307-475.000.
Wong, Hee: *See*—
Russell, Gilbert E.; and Wong, Hee, 4,390,893, Cl. 358-27.000.
Wood, Eric, to Insituform International Inc. Felt material of layer of fine denier felt and layer of coarse denier felt. 4,390,574, Cl. 428-36.000.
Wood, Leonard J.; Parasuraman, Balakrishna; Williams, Edwin H.; Alexander, Mark G.; and Montgomery, Richard C., Jr., to Syscon, Inc. Microprocessor controlled message handling system. 4,390,981, Cl. 370-56.000.
Woodall, Jerry D. Three dimensional contour apparatus and method. 4,390,491, Cl. 264-219.000.

Woodbury, Richard P.: *See*—
Valdiserri, Leo L.; and Woodbury, Richard P., 4,390,696, Cl. 544-214.000.

Woodside, Robert H.; and Drury, Michael J., to Texas Instruments Incorporated. Liquid crystal display system having improved temperature compensation. 4,390,874, Cl. 340-812.000.

Woolfenden, Richard D. G.: *See*—
Ridgway, Frank; and Woolfenden, Richard D. G., 4,390,558, Cl. 426-541.000.

Woolslayer, Joseph R., to Lee C. Moore Corporation. Infinitely variable crown block positioning. 4,390,162, Cl. 254-398.000.

Worsham, Doyle H. Steering stabilizer structure for the front wheels of a vehicle. 4,390,190, Cl. 280-94.000.

Wozniak, Donald R., to Carpenter Technology Corporation. Gaging device. 4,390,496, Cl. 376-245.000.

Wright, Joseph B.: *See*—
Johnson, David A.; Wright, Joseph B.; and Pashoogian, Michael, 4,390,039, Cl. 137-315.000.

Wright, Richard E., to Paper, Calmenson & Co. Replaceable cutting blade assembly for dozers. 4,390,071, Cl. 172-701.300.

Wu, Ta-Ming; and Gaertner, Gregory E., to Burroughs Corporation. LSI Timing circuit for a digital display employing a modulo eight counter. 4,390,780, Cl. 377-44.000.

Wuermseer, Matthias, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for securing a wing to the body of a craft. 4,390,153, Cl. 244-131.000.

Wulf, Helmut: *See*—
Bahrle, Friedrich; Binder, Hellmuth; Meyer, Wolfram; and Wulf, Helmut, 4,389,945, Cl. 104-247.000.

Wurms, Charles: *See*—
Cosgrove, James F.; Dahlke, Gerhard P.; and Wurms, Charles, 4,390,571, Cl. 427-43.100.

Wurst, John W.: *See*—
Brown, Jack; and Wurst, John W., 4,390,823, Cl. 318-331.000.

Wurttembergische Metallwarenfabrik: *See*—
Hoesselbarth, Helmut, 4,389,924, Cl. 99-289.00R.

Wurz, Dieter: *See*—
Ernst, Gunter; and Wurz, Dieter, 4,390,481, Cl. 261-112.000.

Wygant, N. Duane; and Jones, Stanley C., to Marathon Oil Company. Fluid conductivity device for measuring fluid volumes and method therefor. 4,390,842, Cl. 324-439.000.

Wylie, Mark E.: *See*—
Kucherer, Harvey D.; Kugler, Ralph W.; Rieben, Stuart L.; Wilhelm, John J.; and Wylie, Mark E., 4,390,042, Cl. 138-89.000.

Wysocki, Gregory E. Loose product bagging and baling system. 4,389,834, Cl. 53-475.000.

Xerox Corporation: *See*—
Sultan, S. Bertil, 4,390,886, Cl. 346-140.0PD.

Yaegashi, Takehisa; and Kinugasa, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for electronically controlling fuel injection. 4,389,996, Cl. 123-491.000.

Yaegashi, Takehisa: *See*—
Koide, Toshikazu; and Yaegashi, Takehisa, 4,389,995, Cl. 123-491.000.

Yajika, Kazuo: *See*—
Onigata, Yoshio; Fukui, Tsutomu; and Yajika, Kazuo, 4,390,977, Cl. 369-50.000.

Yamada, Akihiro: *See*—
Kawashima, Keisuke; Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, 4,390,966, Cl. 364-900.000.

Yamada, Hirotada; Jimpo, Kiyokazu; Okuda, Takao; Noguchi, Hiroshi; and Tobiki, Hisao, to Sumitomo Chemical Company, Ltd. Antimicrobial 7-(α-acylamino-α-arylacetamido)-3-(substituted methyl)cephalosporin compounds. 4,390,535, Cl. 424-246.000.

Yamada, Hisashi; and Sugawara, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Muting device. 4,390,847, Cl. 330-51.000.

Yamada, Toshihiko: *See*—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; and Yamada, Toshihiko, 4,390,003, Cl. 126-96.000.

Yamagishi, Frederick G., to Hughes Aircraft Company. Environmentally protected IR windows. 4,390,595, Cl. 428-446.000.

Yamaguchi, Toshio: *See*—
Ando, Shizuka; Oyama, Hiroshi; and Yamaguchi, Toshio, 4,389,738, Cl. 4-420.200.

Yamaki, Kiyoshi: *See*—
Mori, Kazuyuki; Mizote, Masanori; Takeda, Hitoshi; Yamaki, Kiyoshi; Suzuki, Hidetaka; Nomura, Hiroyuki; and Kawasaki, Teruo, 4,390,948, Cl. 364-424.000.

Yamamoto, Hiroshi; and Uchidoi, Masanori, to Canon Kabushiki Kaisha. Flash camera with photographic mode selector. 4,390,261, Cl. 354-173.000.

Yamamoto, Toshiyuki: *See*—
Nagai, Hidetaka; Wada, Yasushi; Kobayashi, Ichiro; Tamada, Mitsuru; Ushiyama, Keiichi; and Yamamoto, Toshiyuki, 4,390,520, Cl. 424-28.000.

Yamashita, Kiichi; Nakagawa, Junichi; and Kaji, Tadao, to Hitachi, Ltd. Frequency divider. 4,390,960, Cl. 364-703.000.

Yamashita, Kiyoshi: *See*—
Okaniwa, Kenichiro; Masukawa, Toyoaki; Yamashita, Kiyoshi; and Ishikawa, Wataru, 4,390,617, Cl. 430-350.000.

Yamashita, Toshiharu: *See*—
Fujita, Yoshimi; and Yamashita, Toshiharu, 4,390,391, Cl. 156-628.000.

Yamato, Takashi; Endo, Hirofumi; Matsumoto, Kimiichiro; and Miyake, Hajimu, to Ono Pharmaceutical Co., Ltd. Trans-Δ^2-pge alkylsulphonyl amides. 4,390,548, Cl. 424-321.000.

Yanagisawa, Masahiro, to Nippon Electric Co., Ltd. Process of manufacturing a magnetic record member. 4,390,562, Cl. 427-11.000.

Yane, Daryl J.; and Yane, Roger A. Immersion heater. 4,390,776, Cl. 219-523.000.

Yane, Roger A.: *See*—
Yane, Daryl J.; and Yane, Roger A., 4,390,776, Cl. 219-523.000.

Yang, Wen-Jei. Method of injection molding a foamed resin product having a smooth surface involving surface heating of the mold by applying high current low voltage electric power. 4,390,485, Cl. 264-25.000.

Yano, Osahiko: *See*—
Furumoto, Mitsunobu; Yano, Osahiko; Taniguchi, Hiroshi; Kubo, Kanji; and Ohtsu, Masamitsu, 4,390,906, Cl. 360-19.100.

Yano, Satoshi: *See*—
Kawashima, Keisuke; Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, 4,390,966, Cl. 364-900.000.

Yarita, Tomio: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.

Yashima, Iwao: *See*—
Taniguchi, Tokuyuki; Yashima, Iwao; Ota, Masanori; and Sasahara, Hitoshi, 4,390,339, Cl. 8-94.180.

Yasui, Koichi; and Hisano, Jinpei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for injection molding a polyester with improved crystallization thereof. 4,390,493, Cl. 264-328.160.

Yatsu, Tadao; Todo, Akira; and Sotoyama, Toshiki, to Mitsui Petrochemical Industries Ltd. Stretched film structure of the poly-1,3-phenylene terephthalate type. 4,390,683, Cl. 528-194.000.

Yazawa, Chihiro: *See*—
Matsuno, Masahiro; Higuchi, Yasushi; Ohishi, Yutaka; Nakayama, Yoshiki; and Yazawa, Chihiro, 4,390,723, Cl. 562-478.000.

Yeda Research & Development Co. Ltd.: *See*—
Gorecki, Marian; Acquaye, Clemenceau T. A.; Wilchek, Meir; and Rich, Alexander, 4,390,526, Cl. 424-177.000.
Lahav, Meir; Addadi, Lia; and Weissbuch, Isabela, 4,390,722, Cl. 562-402.000.

Yoda, Makoto: *See*—
Imai, Masafumi; Ueno, Hiroshi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,390,671, Cl. 526-125.000.

Yokoyama, Takao: *See*—
Enomoto, Ryo; Yoshioka, Michihiro; and Yokoyama, Takao, 4,390,504, Cl. 422-166.000.

Yoneda, Yoshiki: *See*—
Koide, Kaoru; Yoneda, Yoshiki; and Musashi, Kenkichi, 4,390,560, Cl. 426-582.000.

Yonemori, Shigeaki: *See*—
Oda, Yoshio; Morikawa, Shinsuke; Ikemura, Masaaki; Yarita, Tomio; Noshiro, Makoto; Gotoh, Isao; Jitsugiri, Yukio; Yonemori, Shigeaki; Sato, Kimihiko; and Uchida, Keiichi, 4,390,511, Cl. 423-469.000.

Yoshida Kogyo K.K.: *See*—
Akashi, Shunji, 4,389,758, Cl. 24-205.11R.
Shimono, Muchiji, 4,390,046, Cl. 139-442.000.

Yoshida, Shiro: *See*—
Kurata, Hirotaka; and Yoshida, Shiro, 4,390,801, Cl. 307-409.000.

Yoshida, Syusuke: *See*—
Okamoto, Miyoshi; Yoshida, Syusuke; and Kurata, Nobuo, 4,390,572, Cl. 428-15.000.

Yoshida, Takao: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,390,434, Cl. 252-8.600.

Yoshida, Tsutomu: *See*—
Tabushi, Iwao; Shimokawa, Kazuhiro; Naito, Daiji; Misaki, Susumu; and Yoshida, Tsutomu, 4,390,740, Cl. 570-146.000.

Yoshii, Naoji: *See*—
Moriguchi, Kisoo; and Yoshii, Naoji, 4,390,666, Cl. 525-194.000.

Yoshimura, Isao; and Togashi, Takao, to Asahi-Dow Limited. Low-temperature, shrinkage gas-barrier multilayered film. 4,390,587, Cl. 428-215.000.

Yoshinaga, Makoto, to Olympus Optical Co., Ltd. Field stop operating mechanism for microscopes. 4,390,254, Cl. 350-523.000.

Yoshioka, Hiroshi: *See*—
Kanada, Toshiaki; Suzuki, Kazuhiro; Yoshioka, Hiroshi; Maeda, Kenji; and Tsurumi, Yoshihiro, 4,390,643, Cl. 521-117.000.

Yoshioka, Issei; and Kamimura, Yoichi, to Seiwa Kasei Co., Ltd. Keratin hydrolyzate useful as hair fixatives. 4,390,525, Cl. 424-71.000.

Yoshioka, Masahiro: *See*—
Murata, Naoaki; Yoshioka, Masahiro; Hayashi, Kiyoshi; and Tohi, Yasusuke, 4,390,264, Cl. 355-8.000.

Yoshioka, Michihiro: *See*—
Enomoto, Ryo; Yoshioka, Michihiro; and Yokoyama, Takao, 4,390,504, Cl. 422-166.000.

You, Chin-San. Reinforced racket frame and method of producing same. 4,390,182, Cl. 273-73.00C.

Young, David B.: *See*—
Jennings, Daniel T.; Carniglia, Charles K.; and Young, David B., 4,390,787, Cl. 250-459.100.

Youngstown Steel Door Company, The: *See*—
Madland, Thorvald, 4,390,196, Cl. 292-66.000.

Yu, Ho, to Aluminum Company of America. Removal of fine particles from molten metal. 4,390,364, Cl. 75-67.00A.

Yuda, Takuo, to Nifco Inc. Radiator grille fixing structure. 4,389,759, Cl. 24-214.000.

Yuhara, Akitsuna: *See*—
Kishimoto, Kiyoh[illegible]; Hazama, Katashi; and Yuhara, Akitsuna, 4,390,807, Cl. 310-313.00B.
Z-L Limited Partnership: *See*—
Zilliken, Fritz W., 4,390,559, Cl. 426-545.000.
Zahn, Wolfgang: *See*—
Biedermann, Ernst; Findeis, Gunter; Weber, Klaus; and Zahn, Wolfgang, 4,390,270, Cl. 355-46.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin, 4,390,158, Cl. 251-129.000.
Zalai, Karoly: *See*—
Udvardy Nagy nee Cserey Pechany, Eva; Budai, Miklos; Fekete, Gyorgy; Gorog, Sandor; Herenyi, Bulcsu; Wack, Geza; and Zalai, Karoly, 4,390,625, Cl. 435-119.000.
Zanier, Adriano, to Tesa, S.A. Comparator with pivoting feeler. 4,389,784, Cl. 33-172.00B.
Zechnall, Martin: *See*—
Denz, Helmut; Stumm, Hans-Peter; and Zechnall, Martin, 4,389,994, Cl. 123-478.000.
Zeiss-Stiftung, Carl: *See*—
Prinz, Reinhard, 4,390,260, Cl. 354-65.000.
Zelder, Felix, to Seitz-Werke GmbH. Method and device for recovering an inert gas. 4,390,048, Cl. 141-6.000.
Zellmann, Fred: *See*—
Kennedy, Carl S.; and Zellmann, Fred, 4,390,438, Cl. 252-56.00D.
Zenex Corporation: *See*—
Zenkich, Ilias R., 4,390,223, Cl. 339-61.00R.
Zenith Radio Corporation: *See*—
Johnson, Fred D., 4,390,817, Cl. 315-384.000.
Krenz, Horst M., 4,390,292, Cl. 400-59.000.
Zenkich, Ilias R., to Zenex Corporation. Electrical connector. 4,390,223, Cl. 339-61.00R.
Ziegler, B. Randall, to GAF Corporation. Apparatus for air laid fiberglass mat. 4,390,336, Cl. 425-82.100.
Zilliken, Fritz W., to Z-L Limited Partnership. Isoflavones and related compounds, methods of preparing and using and antioxidant compositions containing same. 4,390,559, Cl. 426-545.000.
Zollner, Manfred: *See*—
Hoffmann, Christian; Zollner, Manfred; and Zwicker, Eberhard, 4,390,756, Cl. 179-107.0BC.
Zorns, John M.: *See*—
Downing, Terry R.; Zorns, John M.; and Croft, Winfred C., 4,390,085, Cl. 188-72.900.
Zucchini, Umberto: *See*—
Cuffiani, Illaro; Galli, Paolo; and Zucchini, Umberto, 4,390,454, Cl. 252-429.00B.
Zuckerman, Stephen D. Three speed drive mechanism for fishing reel. 4,390,147, Cl. 242-215.000.
Zukowski, Henry J. Method for preventing loss of spinal fluid after spinal tap. 4,390,018, Cl. 128-303.00R.
Zwicker, Eberhard, to Siemens Aktiengesellschaft. Electro-acoustical measuring device and method. 4,390,748, Cl. 179-1.00N.
Zwicker, Eberhard: *See*—
Hoffmann, Christian; Zollner, Manfred; and Zwicker, Eberhard, 4,390,756, Cl. 179-107.0BC.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JUNE, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., deceased, to Owens-Illinois, Inc. Machine for producing a plastic-covered glass container. Re. 31,293, Cl. 493-11.000.

Bell Telephone Laboratories, Incorporated: *See*—
Haley, Thomas J.; Merrick, Thomas B.; and Ronne, James S., Re. 31,295, Cl. 370-120.000.

Danna, Dominick: *See*—
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,289, Cl. 128-6.000.
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,290, Cl. 128-6.000.

Doherty, Thomas E.: *See*—
Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., deceased, Re. 31,293, Cl. 493-11.000.

Eigenmann, Ludwig. Road surface marking prefabricated tape material, having retroreflective composite elements associated thereto. Re. 31,291, Cl. 404-14.000.

Erickson, Robert A., to Kennametal Inc. Clamping mechanism for cutting insert. Re. 31,292, Cl. 407-105.000.

Haley, Thomas J.; Merrick, Thomas B.; and Ronne, James S., to Bell Telephone Laboratories, Incorporated. Carrier supply for frequency division multiplexed systems. Re. 31,295, Cl. 370-120.000.

Heyne, Clarence A., deceased: *See*—
Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., deceased, Re. 31,293, Cl. 493-11.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Matsuzaki, Hiroshi; and Tsukiji, Yoshihiro, Re. 31,288, Cl. 29-27.00C.

Kennametal Inc.: *See*—
Erickson, Robert A., Re. 31,292, Cl. 407-105.000.

Marosan, Josef. Material-handling apparatus. Re. 31,294, Cl. 156-396.000.

Matsuzaki, Hiroshi; and Tsukiji, Yoshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Machine tool. Re. 31,288, Cl. 29-27.00C.

Merrick, Thomas B.: *See*—
Haley, Thomas J.; Merrick, Thomas B.; and Ronne, James S., Re. 31,295, Cl. 370-120.000.

Moore, William C.; Newman, Richard W.; and Danna, Dominick, to Welch Allyn, Inc. Color endoscope with charge coupled device and television viewing. Re. 31,289, Cl. 128-6.000.

Moore, William C.; Newman, Richard W.; and Danna, Dominick, to Welch Allyn, Inc. Color endoscope. Re. 31,290, Cl. 128-6.000.

Newman, Richard W.: *See*—
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,289, Cl. 128-6.000.
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,290, Cl. 128-6.000.

Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., deceased, Re. 31,293, Cl. 493-11.000.

Ronne, James S.: *See*—
Haley, Thomas J.; Merrick, Thomas B.; and Ronne, James S., Re. 31,295, Cl. 370-120.000.

Tsukiji, Yoshihiro: *See*—
Matsuzaki, Hiroshi; and Tsukiji, Yoshihiro, Re. 31,288, Cl. 29-27.00C.

Welch Allyn, Inc.: *See*—
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,289, Cl. 128-6.000.
Moore, William C.; Newman, Richard W.; and Danna, Dominick, Re. 31,290, Cl. 128-6.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., to Dynachem Corporation. Photopolymerizable compositions containing polymeric binding agents. B1 3,887,450, Cl. 204—159.15.

Dynachem Corporation: *See*—
Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A. B1 3,887,450, Cl. 204—159.15.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Gross, James R., 269,549, Cl. D24-54.000.

AGA Aktiebolag: *See*—
Braun, Stellan, 269,519, Cl. D15-144.000.
Braun, Stellan, 269,520, Cl. D15-144.000.
Braun, Stellan, 269,521, Cl. D15-144.000.

Akita, Tsugio, to Matsushita Electric Industrial Co., Ltd. Table top mill. 269,489, 6-28-83, Cl. D7-53.000.

Akzona Incorporated: *See*—
Gaizauskas, Bronius, 269,508, Cl. D13-24.000.

Albertson, Darlene J., to Howell, Verna. Baby bunting. 269,475, 6-28-83, Cl. D2-25.000.

Allied Corporation: *See*—
Jarmell, Solomon; and Rodgers, Barry E., 269,544, Cl. D24-8.000.

Amaki, Kiyoshi: *See*—
Suzuki, Toshiyuki; Inaba, Kazumi; and Amaki, Kiyoshi, 269,506, Cl. D12-205.000.

Amar, Carlos P. Combined clock and advertising display device. 269,532, 6-28-83, Cl. D20-20.000.

Amos, Homer C., to Brunswick Corporation. Ball catching and throwing device. 269,536, 6-28-83, Cl. D21-210.000.

Ando, Tsuneo, to Toagosei Chemical Industry Co., Ltd. Container for liquid adhesive. 269,531, 6-28-83, Cl. D19-66.000.

Arduini, Giovanni; and del Corno, Marco, to Italtel S.p.A. Desk telephone. 269,511, 6-28-83, Cl. D14-53.000.

Atkinson Brick Co.: *See*—
Atkinson, Elsie M., 269,552, Cl. D25-86.000.

Atkinson, Elsie M., to Atkinson Brick Co. Brick. 269,552, 6-28-83, Cl. D25-86.000.

Ayr-Way Industries, Inc.: *See*—
Sabelhouse, Paul K., Jr.; and Sabelhouse, Paul K., Sr., 269,507, Cl. D12-306.000.

Beall, Jack C. Support for spools of electrical wires or the like. 269,485, 6-28-83, Cl. D6-85.000.

Becker, Werner, to Esselte Pendaflex Corporation. Labelling apparatus. 269,527, 6-28-83, Cl. D18-19.000.
Berner, John M. Snow thrower. 269,514, 6-28-83, Cl. D15-12.000.
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Braun, Stellan, to AGA Aktiebolag. Nozzle component for a cutting torch. 269,521, 6-28-83, Cl. D15-144.000.
Brier, Daniel L. Sock. 269,476, 6-28-83, Cl. D2-331.000.
Brier, Daniel L. Sock. 269,477, 6-28-83, Cl. D2-331.000.
Brown, Maynard H., Jr. Compound hand tool. 269,496, 6-28-83, Cl. D8-81.000.
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Burge, Charles T., to Norlin Industries, Inc. Bass guitar or similar article. 269,524, 6-28-83, Cl. D17-14.000.
Cannon, Raymond E., to IMED Corporation. Disposable cassette for use with an intravenous controller. 269,545, 6-28-83, Cl. D24-8.000.
Chase, Richard A.; Simpson, Danny E.; and Williams, D. Michael, to Johnson & Johnson Baby Products Company. Rolling toy. 269,533, 6-28-83, Cl. D21-64.000.
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Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,510, 6-28-83, Cl. D13-30.000.
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Mundy, Patricia R. Infant sleeping bag or similar article. 269,474, 6-28-83, Cl. D2-17.000.
Nagele, Albert L., to VCS, Inc. Television camera or similar article. 269,513, 6-28-83, Cl. D14-78.000.
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Peterson, Clifford J.; Dawes, Peter; and Birks, Gary E. Hair curling iron or the like. 269,555, 6-28-83, Cl. D28-35.000.
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Souza, Edward P. Combined dispenser and brush attachment for a shaving cream container or the like. 269,481, 6-28-83, Cl. D4-19.000.
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Tanaka, Masaharu, to Kabushiki Kaisha Suwa Seikosha. Digital wristwatch. 269,502, 6-28-83, Cl. D10-38.000.
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Tucker, Richard B. C., to STX, Inc. Golf putter head. 269,537, 6-28-83, Cl. D21-219.000.
Tung, Wai-Kuen, to Best Toys Co. Ltd., The. Toy monkey. 269,535, 6-28-83, Cl. D21-150.000.
Ungaro, Nicholas A., to Schweiger Industries, Inc. Lounge seat or similar article. 269,482, 6-28-83, Cl. D6-37.000.
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Walper, Robert R.; and Wilkes, Frederick R., to Walper Corporation. Traction table. 269,543, 6-28-83, Cl. D24-03.000.
Wilkes, Frederick R.: *See*—
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Williams, William O., Jr. Artificial fishing lure. 269,539, 6-28-83, Cl. D22-27.000.
Witt, Frank H., Jr., to Levine, Rosalie S.; Bisacca, Mildred J.; and GRRN Co., part interest to each. Flask or similar article. 269,498, 6-28-83, Cl. D9-307.000.
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Yanai, Taro. Lighter. 269,554, 6-28-83, Cl. D27-36.000.
Yoder, Andrew C. Quick coupler mount for front of farm tractor. 269,515, 6-28-83, Cl. D15-32.000.

LIST OF PLANT PATENTEES

Fischer, Arnold W., to Pan-American Plant Company. African violet named Joyce. 5,063, 6-28-83, Cl. 69.000.
Pan-American Plant Company: *See*—
Fischer, Arnold W., 5,063, Cl. 69.000.
Shoesmith, May, 5,064, Cl. 78.000.
Shoesmith, May, to Pan-American Plant Company. Chrysanthemum named Tiger. 5,064, 6-28-83, Cl. 78.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 28, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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126	4,389,867
132	4,389,868
319	4,389,869
354	4,389,870
356	4,389,871
388	4,389,872
	4,389,873
389	4,389,874
393	4,389,875

CLASS 73

27 R	4,389,876
37	4,389,877
38	4,389,878
61 R	4,389,879
86	4,389,880
116	4,389,881
118	4,389,882
119 R	4,389,883
146.5	4,389,884
151.5	4,389,885
168	4,389,886
189	4,389,887
299	4,389,888
304 C	4,389,889
431	4,389,890
579	4,389,891
586	4,389,892
599	4,389,893
637	4,389,894
724	4,389,895
784	4,389,896
861	4,389,897
861.12	4,389,898
861.28	4,389,899
861.42	4,389,900
861.58	4,389,901
861.77	4,389,902
863.03	4,389,903
863.11	4,389,904
863.54	4,389,905
863.55	4,389,906

CLASS 74

529	4,389,907
711	4,389,908
	4,389,909
843	4,389,910

CLASS 75

0.5 BA	4,390,361
49	4,390,362
63	4,390,363
67 A	4,390,364
84.4	4,390,365
101 BE	4,390,366
125	4,390,367
251	4,390,368

CLASS 76

74	4,389,911

CLASS 81

43	4,389,912
53.2	4,389,913

CLASS 84

1.01	4,389,914
1.24	4,389,915
278	4,389,916
309	4,389,917

CLASS 89

34	4,389,918
185	4,389,919
190	4,389,920

CLASS 92

59	4,389,921
156	4,389,922

CLASS 98

115 VM	4,389,923

CLASS 99

289 R	4,389,924
	4,389,925
495	4,389,926
575	4,389,927

CLASS 100

37	4,389,928
88	4,389,929
	4,389,930
90	4,389,931
162 B	4,389,932
	4,389,933

CLASS 101

92	4,389,934
93.01	4,389,935
123	4,389,936

CLASS 102

249	4,389,937
337	4,389,938
458	4,389,939
489	4,389,940

CLASS 104

49	4,389,941
103	4,389,942
166	4,389,943
172 S	4,389,944
247	4,389,945

CLASS 106

31	4,390,369
38.3	4,390,370
88	4,390,371
90	4,390,372
287.12	4,390,373
300	4,390,374

CLASS 108

115	4,389,946

CLASS 109

1 S	4,389,947
82	4,389,948

CLASS 110

101 CF	4,389,949
235	4,389,950

CLASS 112

121.27	4,389,951
128 R	4,389,952
158 E	4,389,953
	4,389,954
184	4,389,955
240	4,389,956
262.3	4,389,957

CLASS 114

39	4,389,958
74 R	4,389,959
248	4,389,960
345	4,389,961

CLASS 116

272	4,389,962
308	4,389,963

CLASS 118

66	4,389,964
261	4,389,965
405	4,389,966
500	4,389,967
652	4,389,968
665	4,389,969
666	4,389,970
669	4,389,971
691	4,389,972
725	4,389,973

CLASS 119

2	4,389,974
51 R	4,389,975
62	4,389,976
72.5	4,389,977

CLASS 122

4 D	4,389,978
15	4,389,979
114	4,389,980

CLASS 123

3	4,389,981
73 R	4,389,982
143 B	4,389,983
196 S	4,389,984
198 F	4,389,985
298	4,389,986
300	4,389,987
306	4,389,988
339	4,389,989
353	4,389,990
383	4,389,991
419	4,389,992
421	4,389,993
478	4,389,994
491	4,389,995
	4,389,996
492	4,389,997
502	4,389,998
536	4,389,999
549	4,390,000
571	4,390,001

CLASS 126

25 R	4,390,002
96	4,390,003
104 A	4,390,004
110 B	4,390,005
140	4,390,006
350 R	4,390,007
427	4,390,008
439	4,390,009
450	4,390,010

CLASS 127

37	4,390,375

CLASS 128

1 R	4,390,011
4	4,390,012
6	Re.31,289
	Re.31,290
55	4,390,013
78	4,390,014
80 R	4,390,015
303 R	4,390,018
325	4,390,019
419 PG	4,390,020
	4,390,021
	4,390,022
421	4,390,023
460	4,390,024
660	4,390,025
	4,390,026
743	4,390,027
777	4,390,028

CLASS 131

109 AB	4,390,029
231	4,390,030
281	4,390,032
336	4,390,031

CLASS 132

7	4,390,033

CLASS 134

6	4,390,376
104	4,390,034

CLASS 136

258	4,390,743

CLASS 137

99	4,390,035
116.5	4,390,036
240	4,390,037
296	4,390,038
315	4,390,039
340	4,390,040
488	4,390,041

CLASS 138

89	4,390,042
	4,390,043

CLASS 139

91	4,390,045
98	4,390,044
442	4,390,046

CLASS 140

93.2	4,390,047

CLASS 141

6	4,390,048
92	4,390,049

CLASS 145

46	4,390,050

CLASS 148

12 B	4,390,377
111	4,390,378
171	4,390,379

CLASS 149

8	4,390,380

CLASS 150

1	4,390,051

CLASS 152

213 A	4,390,053
356 R	4,390,052

CLASS 156

63	4,390,381
184	4,390,382
196	4,390,383
221	4,390,384
229	4,390,385
235	4,390,386
351	4,390,388
396	Re.31,294
502	4,390,389
566	4,390,390
628	4,390,391
643	4,390,392
	4,390,393
	4,390,394

CLASS 160

265	4,390,054
348	4,390,055

CLASS 162

5	4,390,395

CLASS 164

7.1	4,390,056
459	4,390,057

CLASS 165

1	4,390,058
76	4,390,059
	4,390,060

CLASS 166

53	4,390,061
59	4,390,062
84	4,390,063
99	4,390,064
181	4,390,065
245	4,390,066
	4,390,067
267	4,390,068

CLASS 169
15 4,390,069

CLASS 172
54.5 4,390,070
701.3 4,390,071

CLASS 174
41 4,390,744
73 R 4,390,745

CLASS 175
229 4,390,072

CLASS 177
118 4,390,073
177 4,390,074
210 FP 4,390,075

CLASS 179
1 GE 4,390,746
1 GJ 4,390,749
1 N 4,390,748
1 SC 4,390,747
1 VL 4,390,834
5 R 4,390,750
6.07 4,390,751
6.16 4,390,752
81 R 4,390,753
84 VF 4,390,754
98 4,390,755
107 BC 4,390,756

CLASS 180
11 4,390,076

CLASS 181
121 4,390,077
185 4,390,078
227 4,390,079

CLASS 182
115 4,390,080
151 4,390,081

CLASS 184
6.4 4,390,082
7 F 4,390,083

CLASS 188
71.7 4,390,084
72.9 4,390,085
79.5 B 4,390,086

CLASS 190
41 B 4,390,087
51 4,390,088

CLASS 192
105 B 4,390,089

CLASS 193
32 4,390,090

CLASS 198
358 4,390,091
638 4,390,092
654 4,390,093
865 4,390,094

CLASS 200
11 G 4,390,757
43 4,390,758
52 A 4,390,759
61.04 4,390,760
67 C 4,390,761
144 B 4,390,762
4,390,763
148 A 4,390,764
159 B 4,390,765

CLASS 202
166 4,390,396
243 4,390,397

CLASS 203
18 4,390,398

CLASS 204
159.15 B1 3,887,450
32 R 4,390,399
67 4,390,400
159.24 4,390,401
180 P 4,390,402
180 R 4,390,403
192 E 4,390,404
206 4,390,407
284 4,390,408
415 4,390,405
435 4,390,406

CLASS 206
150 4,390,095
390 4,390,096
418 4,390,097

CLASS 208
8 LE 4,390,409
4,390,410
11 LE 4,390,411
48 R 4,390,412
61 4,390,413
111 4,390,414
113 4,390,415
120 4,390,416
188 4,390,417
326 4,390,418

CLASS 209
11 4,390,419
403 4,390,420
571 4,390,098

CLASS 210
86 4,390,421
188 4,390,422
222 4,390,423
232 4,390,424
4,390,425
243 4,390,426
333.01 4,390,427
400 4,390,428
519 4,390,429
527 4,390,430
724 4,390,431
748 4,390,432
767 4,390,433

CLASS 211
4 4,390,099
10 4,390,100
41 4,390,101
71 4,390,102
182 4,390,103

CLASS 215
232 4,390,104

CLASS 219
10.55 B 4,390,766
4,390,768
10.55 D 4,390,767
10.77 4,390,769
56.21 4,390,770
56.22 4,390,771
121 FS 4,390,774
121 PQ 4,390,772
121 PR 4,390,773
124.34 4,390,775
127 4,390,777
523 4,390,776

CLASS 220
3.6 4,390,105
3.7 4,390,106
202 4,390,107
228 4,390,108
234 4,390,109
259 4,390,111
274 4,390,112
306 4,390,113
318 4,390,110
337 4,390,114

CLASS 222
326 4,390,115

CLASS 224
209 4,390,116
310 4,390,117

CLASS 226
25 4,390,118
196 4,390,119

CLASS 228
180 R 4,390,120

CLASS 229
17 G 4,390,121

CLASS 232
35 4,390,122

CLASS 235
89 R 4,390,778

CLASS 236
16 4,390,123

CLASS 237
12.3 A 4,390,124
70 4,390,125

CLASS 239
1 4,390,126
83 4,390,127
284 A 4,390,128
533.5 4,390,129
585 4,390,130

CLASS 241
1 4,390,131
55 4,390,132
93 4,390,133
101.2 4,390,134
4,390,135
275 4,390,136

CLASS 242
54 R 4,390,137
55 4,390,138
66 4,390,139
84.52 C 4,390,140
86.5 R 4,390,141
96 4,390,142
107.4 A 4,390,143
118.3 4,390,144
186 4,390,145
200 4,390,146
215 4,390,147

CLASS 244
19 4,390,148
31 4,390,149
45 R 4,390,150
108 4,390,151
118.5 4,390,152
131 4,390,153

CLASS 248
346 4,390,154
507 4,390,155

CLASS 249
80 4,390,156

CLASS 250
204 4,390,781
223 B 4,390,782
270 4,390,783
287 4,390,784
330 4,390,785
385 4,390,786
459.1 4,390,787
491.1 4,390,788
492.2 4,390,789
551 4,390,790
578 4,390,791

CLASS 251
30 4,390,157
129 4,390,158
148 4,390,159
149.6 4,390,160

CLASS 252
8.6 4,390,434
4,390,435
49.3 4,390,436
51.5 A 4,390,437
56 D 4,390,438
73 4,390,439
76 4,390,440
96 4,390,441
106 4,390,442
174.11 4,390,443
4,390,444
175 4,390,445
182.1 4,390,446
4,390,447
187.26 4,390,448
299.63 4,390,467
301.6 F 4,390,449
307 4,390,450
311 4,390,451
408.1 4,390,452
426 4,390,453
429 B 4,390,454
430 4,390,455
448 4,390,456
455 Z 4,390,457
503 4,390,458
511 4,390,459
518 4,390,460
519 4,390,461
522 R 4,390,462
4,390,463
4,390,464
527 4,390,465
548 4,390,466

CLASS 254
356 4,390,161
398 4,390,162
412 4,390,163

CLASS 256
24 4,390,165
65 4,390,164

CLASS 260
112 R 4,390,468
123.5 4,390,469
166 4,390,470
244.4 4,390,471
398.6 4,390,472
429 R 4,390,473
505 C 4,390,476
505 R 4,390,474
505 S 4,390,475
927 R 4,390,477

CLASS 261
6 4,390,478
27 4,390,479
34 A 4,390,480
112 4,390,481

CLASS 264
1.4 4,390,482
7 4,390,483
9 4,390,484
25 4,390,485
45.5 4,390,486
107 4,390,487
126 4,390,489
173 4,390,490
219 4,390,491
255 4,390,492
328.16 4,390,493

CLASS 266
44 4,390,166
48 4,390,167
142 4,390,168
196 4,390,169
272 4,390,170

CLASS 267
169 4,390,171

CLASS 269
56 4,390,172
328 4,390,173

CLASS 271
108 4,390,174
157 4,390,175
270 4,390,176

CLASS 272
73 4,390,177
114 4,390,178
118 4,390,179
126 4,390,180

CLASS 273
26 A 4,390,181
73 C 4,390,182
148 A 4,390,183
183 D 4,390,184

CLASS 277
235 B 4,390,185
236 4,390,186

CLASS 280
6 R 4,390,187
6.1 4,390,188
81 A 4,390,189
94 4,390,190
281 R 4,390,191
425 A 4,390,192
777 4,390,193

CLASS 282
27.5 4,390,194

CLASS 292
53 4,390,195
66 4,390,196
144 4,390,197
152 4,390,198
346 4,390,199

CLASS 294
27 H 4,390,200

CLASS 296
1 C 4,390,201
97 K 4,390,202
223 4,390,203

CLASS 297
16 4,390,204
129 4,390,205
300 4,390,206
362 4,390,207
379 4,390,208
410 4,390,209
452 4,390,210

CLASS 299
57 4,390,211
4,390,212

CLASS 303
24 A 4,390,213

CLASS 305
35 R 4,390,214

CLASS 307
10 BP 4,390,792
118 4,390,793
140 4,390,794
143 4,390,795
261 4,390,796
264 4,390,797
296 R 4,390,798
310 4,390,799
400 4,390,800
409 4,390,801
475 4,390,802
578 4,390,803

CLASS 308
6 C 4,390,215
6 R 4,390,216

CLASS 310
70 R 4,390,804
154 4,390,805
261 4,390,806
313 B 4,390,807

CLASS 312
205 4,390,217

CLASS 313
482 4,390,809
500 4,390,810
584 4,390,808

CLASS 315
73 4,390,811
200 A 4,390,812
248 4,390,813
320 4,390,814
368 4,390,815
370 4,390,816
384 4,390,817
408 4,390,818
411 4,390,819
4,390,820

CLASS 318
85 4,390,821
114 4,390,822
331 4,390,823
4,390,824
384 4,390,825
439 4,390,826
687 4,390,827

CLASS 320
32 4,390,828

CLASS 323
231 4,390,829
237 4,390,830
240 4,390,831
273 4,390,832
280 4,390,833

CLASS 324
51 4,390,835
54 4,390,836
73 R 4,390,837
77 E 4,390,838
116 4,390,839
309 4,390,840
427 4,390,841
439 4,390,842

CLASS 328
138 4,390,843
142 4,390,844

CLASS 329
103 4,390,845

CLASS 330
10 4,390,846
51 4,390,847
151 4,390,848
251 4,390,849
253 4,390,850
277 4,390,851
300 4,390,852

CLASS 333
1.1 4,390,853
193 4,390,854

CLASS 335
166 4,390,855
256 4,390,856
282 4,390,857

CLASS 336
92 4,390,858

CLASS 338
25 4,390,859
38 4,390,860

CLASS 339
9 E 4,390,218
14 R 4,390,219
17 CF 4,390,220
17 M 4,390,221
45 M 4,390,222
61 R 4,390,223
75 MP 4,390,224
88 R 4,390,225
89 M 4,390,226
103 C 4,390,227
113 R 4,390,228
115 R 4,390,229
125 R 4,390,230
217 S 4,390,231
224 4,390,232
255 R 4,390,233

CLASS 340
27 R 4,390,861
61 4,390,862
310 R 4,390,863
347 NT 4,390,864
347 SY 4,390,865
365 E 4,390,866
542 4,390,867
568 4,390,868
632 4,390,869
648 4,390,870
659 4,390,871
679 4,390,872
710 4,390,873
812 4,390,874
815.27 4,390,875
825.17 4,390,876
825.72 4,390,877
856 4,390,878
870.37 4,390,879

CLASS 343
6.8 LC 4,390,880
100 LE 4,390,881

CLASS 346
1.1 4,390,882
75 4,390,883
139 C 4,390,884
140 PD 4,390,886
140 R 4,390,885
155 4,390,887

CLASS 349
74 4,390,706

CLASS 350
3.65 4,390,234
6.1 4,390,235
96.14 4,390,236
96.20 4,390,237
96.23 4,390,238
120 4,390,239
258 4,390,240
296 4,390,241
318 4,390,242
319 4,390,243
333 4,390,244
343 4,390,245
357 4,390,246
358 4,390,247
427 4,390,248
453 4,390,249
465 4,390,250
467 4,390,251
471 4,390,252
505 4,390,253
523 4,390,254

CLASS 351
139 4,390,256
212 4,390,255

CLASS 353
95 4,390,257

CLASS 354
24 4,390,258
34 4,390,259
65 4,390,260
173 4,390,261
230 4,390,262
286 4,390,263

CLASS 355
8 4,390,264
14 D 4,390,265
14 E 4,390,266
4,390,267
15 4,390,268
27 4,390,269
46 4,390,270
77 4,390,271
84 4,390,272
125 4,390,273

CLASS 356
36 4,390,274
43 4,390,275
251 4,390,276
371 4,390,277
392 4,390,278
401 4,390,279
445 4,390,280

CLASS 357
30 4,390,888
4,390,889
44 4,390,890
79 4,390,891

CLASS 358
17 4,390,892
27 4,390,893
36 4,390,894

44 4,390,895
73 4,390,896
101 4,390,897
119 4,390,898
120 4,390,899
147 4,390,900
4,390,901
192.1 4,390,902
282 4,390,903
335 4,390,904

CLASS 360

2 4,390,905
19.1 4,390,906
32 4,390,907
70 4,390,908
71 4,390,909
77 4,390,910
4,390,911
78 4,390,912
85 4,390,913
96.5 4,390,914
104 4,390,915
127 4,390,916
128 4,390,917
137 4,390,918

CLASS 361

56 4,390,919
75 4,390,920
119 4,390,921
170 4,390,922
222 4,390,923
279 4,390,924
283 4,390,925
334 4,390,926

CLASS 362

72 4,390,927
101 4,390,928
216 4,390,929
224 4,390,930
267 4,390,931
269 4,390,932
270 4,390,933
291 4,390,934
306 4,390,935
390 4,390,936

CLASS 363

22 4,390,937
54 4,390,938
129 4,390,939
132 4,390,940
174 4,390,941

CLASS 364

162 4,390,942
200 4,390,943
4,390,944
4,390,945
4,390,946
4,390,947
400 4,390,965
424 4,390,948
429 4,390,949
434 4,390,950
436 4,390,951
464 4,390,952
474 4,390,953
477 4,390,954
490 4,390,955
510 4,390,956
550 4,390,957
4,390,958
557 4,390,959
703 4,390,960
756 4,390,961
768 4,390,962
900 4,390,963
4,390,964
4,390,966
4,390,967
4,390,968
4,390,969

CLASS 365

73 4,390,970
104 4,390,971
222 4,390,972

CLASS 366

3 4,390,281
40 4,390,282
142 4,390,283
165 4,390,284
168 4,390,285
186 4,390,286

CLASS 367

40 4,390,973
76 4,390,974
82 4,390,975
153 4,390,976

CLASS 368

240 4,390,287
276 4,390,288
286 4,390,289

CLASS 369

50 4,390,977
220 4,390,978
270 4,390,979

CLASS 370

19 4,390,980
56 4,390,981
67 4,390,982
77 4,390,983
88 4,390,984
94 4,390,985
99 4,390,986
112 4,390,987
113 4,390,988
120 Re.31,295

CLASS 371

22 4,390,989
57 4,390,990

CLASS 372

21 4,390,991
70 4,390,992
87 4,390,993
99 4,390,994

CLASS 374

142 4,390,290
160 4,390,291

CLASS 376

107 4,390,494
120 4,390,495
245 4,390,496
414 4,390,497

CLASS 377

6 4,390,779
44 4,390,780

CLASS 400

59 4,390,292
144.2 4,390,293
196.1 4,390,294
330.1 4,390,295
608 4,390,296
697.1 4,390,297

CLASS 401

122 4,390,298
258 4,390,299

CLASS 403

24 4,390,300
27 4,390,301
187 4,390,302
284 4,390,303

CLASS 404

14 Re.31,291
110 4,390,304

CLASS 405

124 4,390,306
186 4,390,305
228 4,390,307
299 4,390,308

CLASS 407

105 Re.31,292

CLASS 408

76 4,390,309
141 4,390,310

CLASS 409

232 4,390,311

CLASS 414

24.6 4,390,312
412 4,390,313
547 4,390,314
740 4,390,315

CLASS 415

76 4,390,316
143 4,390,317
145 4,390,318
209 4,390,319

CLASS 416

97 R 4,390,320

CLASS 417

15 4,390,321
243 4,390,322
253 4,390,323
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D2—	17	269,474		308	269,516	D10—	31	269,501		32	269,515		66	269,531		03	269,543
	25	269,475			269,517		38	269,502		140	269,518	D20—	20	269,532		17	269,546
	331	269,476		309	269,488		46	269,503		144	269,519	D21—	64	269,533		19	269,548
		269,477	D8—	1	269,490		71	269,504			269,520		150	269,534		26	269,547
D3—	61	269,478		5	269,491	D12—	85	269,505			269,521			269,535		54	269,549
	71	269,479		14	269,492		205	269,506		147	269,522		210	269,536	D25—	22	269,550
	76	269,480		30	269,493		306	269,507	D17—	14	269,523		219	269,537		80	269,551
D4—	19	269,481		47	269,494	D13—	24	269,508			269,524		251	269,538		86	269,552
D6—	37	269,482			269,495		30	269,509	D18—	19	269,525	D22—	27	269,539	D26—	63	269,553
	57	269,483		81	269,496			269,510			269,526	D23—	35	269,540	D27—	36	269,554
	83	269,484		88	269,497	D14—	53	269,511			269,527		123	269,541	D28—	35	269,555
	85	269,485	D9—	307	269,498		66	269,512		22	269,528		127	269,542	D30—	44	269,556
	116	269,486		349	269,499		78	269,513	D19—		269,529	D24—	8	269,544	D32—	19	269,557
	162	269,487		350	269,500	D15—	12	269,514		47	269,530			269,545		22	269,558
D7—	53	269,489															

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01 : 4,389,904
4,390,190
02 : 4,390,151
04 : 4,389,813
4,390,073
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DESIGN PATENTS

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